Bicycle Advisory Board Agenda

Regular Meeting
Tuesday, October 20, 2026
6:00 PM
Hybrid - Council Briefing Center / Microsoft Teams
808 W Spokane Falls Blvd, Spokane, WA 99201
Virtual Meeting Link - See page two for Information

TIMES GIVEN BELOW ARE AN ESTIMATE AND ARE SUBJECT TO CHANGE

Briefing Session – 6:00-6:15

1. Roll Call – Staff
2. Public Comment Period – Citizens are invited to address the Bicycle Advisory Board on any topic not on the agenda. 3 minutes each.
3. Approve 7/21/2026 and 9/16/2026 meeting minutes – All
4. Chair Report
5. Staff Liaison Report – Tyler Kimbrell
6. Approval of current agenda – All

Workshops: (All times below are approximate)

1. 6:15 – 7:15 Bikeway Design Standards, Vision Zero Action Plan, Quick Build Guide
   (Tyler Kimbrell, Wende Wilbur, Kittelson & Associates, Inc.)
2. 7:15 – 7:30 Transportation Commission Representative Selection (Tyler Kimbrell)

Adjournment: The next regularly scheduled BAB meeting will be Tuesday, November 17, 2026.

*Items denoted with an asterisk may include final action taken by the Board. Written public comments will be accepted at bicycleadvisoryboard@spokanecity.org on these items up to two hours prior to the start of the meeting. Verbal testimony may also be accepted during the meeting.

AMERICANS WITH DISABILITIES ACT (ADA) INFORMATION: The City of Spokane is committed to providing equal access to its facilities, programs and services for persons with disabilities. The Council Briefing Center in the lower level of Spokane City Hall, 808 W. Spokane Falls Blvd., is wheelchair accessible and also is equipped with an infrared assistive listening system for persons with hearing loss. Headsets may be checked out (upon presentation of picture I.D.) through the meeting organizer. Individuals requesting reasonable accommodations or further information may call, write, or email Human Resources at 509.625.6373, 808 W. Spokane Falls Blvd., Spokane, WA, 99201; or ddecorde@spokanecity.org. Persons who are deaf or hard of hearing may contact Human Resources through the Washington Relay Service at 7-1-1. Please contact us forty-eight (48) hours before the meeting date.

Bicycle Advisory Board Teams Meeting Information

Tuesday, October 20, 2026

The BAB will be held in a hybrid in-person / virtual format. Members of the public are welcome to attend in person at City Hall or online using the following information.

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 227 451 660 092

Passcode: 46Lo3aR3

Dial in by phone

+1 323-618-1887,,294668213# United States, Los Angeles

Find a local number

Phone conference ID: 294 668 213#

Join on a video conferencing device

Tenant key: cityofspokane@m.webex.com

Video ID: 119 267 657 3

More info

Please note that public comments will be taken during the meeting, but the public is encouraged to continue to submit their comments or questions in writing to: bicycleadvisoryboard@spokanecity.org. Written public comments will be accepted on these items up to one hour prior to the start of the meeting.

The audio proceedings of the BAB meetings will be recorded and are available online.

Bicycle Advisory Board – Meeting Minutes Draft

Tuesday, July 21, 2026
City Council Briefing Center
Meeting called to order at 6:00 PM by Lauren Pangborn

Public Comment: Citizens are invited to address the Bicycle Advisory Board on any topic not on the agenda. 3 Minutes each.

- *Matt*

Attendance:

- Board Members Present: Lauren Pangborn, Brian Falteisek, Christina Ramirez, Satish Shrestha, Olga Lucia Herrera, Claudine Zender, Daniel Powell, Jered Sweeney-Demezas, Cole Swensen, Scott Gordon
- Board Members Not Present: Santiago Cruz
- *Quorum Present*: Yes
- Staff Members Present: Tyler Kimbrell

Minutes: Minutes from 4/21/2026 and 5/19/2026 approved unanimously.

Briefing Session:

- **Chair Report – Lauren Pangborn**
  - Everyone here is pretty good with understanding bikes and their relationship to transit and pedestrians. Lauren encouraged everyone to spend some time thinking about transit this week and vote accordingly. Ballots should be arriving soon if they haven't already.
  - Lauren's time on the Bicycle Advisory Board is coming to a close sometime over the next few months. Lauren will be joining a different City commission and will be asked to step down from this board.
- **Staff Liaison Report – Tyler Kimbrell**
  - Brian and Santiago are both coming up for reappointment. Tyler will confirm with them individually if they are interested in renewing their terms.
  - Next month, Tyler will bring the Bikeway Design Guide and Vision Zero Action Plan to the board, which Tyler has been working on for the last five or six months. The Bikeway Design Guide is going to be an update to the City's Engineering standards. It will encompass shared use paths, standard bike lanes, buffered bike lanes, crossings, etc. It is not done, but it is getting to the point where we can start showing parts of it. The Vision Zero Action Plan will also be coming to the board at the same time. We're working with Kittleson on both of these projects. The Vision Zero Action Plan is identifying a high injury network across the City and recommending systemic actions for dangerous streets designs.
  - Tyler highlighted three projects that are out to bid:
    - Fish Lake Trail Construction Phase 1
    - Traffic Calming (Cycle 14) Quick Builds
    - Pacific Avenue Greenway

Current Agenda: The current agenda was approved.

Informational, Discussion and/or Action Items:

- Spokane Regional Transportation Council
  - Presentation provided by: Jason Lien, SRTC and Angela Paparazzo, SRTC
  - Questions asked and answered.
  - Discussion ensued.

DRAFT

- Spokane Reimagined Week Without Driving
    - Presentation provided by: Emily Loeffler, Spokane Reimagined
    - Questions asked and answered.
    - Discussion ensued.

- September Mobile Meeting Discussion
    - Presentation provided by: Tyler Kimbrell, City of Spokane
    - Questions asked and answered.
    - Discussion ensued.

Meeting Adjourned at 7:28 PM.

The next regularly scheduled Bicycle Advisory Board Meeting is on Tuesday, August 18, 2026.

DRAFT

Bicycle Advisory Board – Meeting Minutes Draft

Tuesday, September 15, 2026
Special Mobile Meeting
Bicycle Advisory Board mobile meeting began at 6:15 PM.

Public Comment: No public comment was taken.

Attendance:

- Board Members Present: Lauren Pangborn, Brian Falteisek, Christina Ramirez, Satish Shrestha, Olga Lucia Herrera, Claudine Zender, Daniell Powell, Jered Sweeney-Demezas, Cole Swensen, Scott Gordon, Santiago Cruz
- Board Members Not Present: None
- *Quorum Present*: Yes
- Staff Members Present: Tyler Kimbrell

Informational, Discussion and/or Action Items:

- Itinerary
  - Start – 6:15PM – City of Spokane City Hall, 808 W Spokane Falls Blvd
  - Midpoint Stop – 7:00PM – Cincinnati St @ Desmet Ave
  - End – 7:30PM – City of Spokane City Hall, 808 W Spokane Falls Blvd

Meeting Adjourned at 4:37 PM.

The next regularly scheduled Bicycle Advisory Board Meeting is on Tuesday, October 20, 2026.

DRAFT

BRIEFING PAPER: Bikeway Design Standards

City of Spokane
Bicycle Advisory Board
10/20/2026

Subject:
The City of Spokane Safe Streets 4 All project has three main elements, an update to the bikeway design standards, vision zero safety action plan, and a new quick build guide. These elements are intended to improve transparency in the bikeway design and implementation process and to increase the chances of funding portions of the bikeway network.

The Bikeway Design Standards update will improve upon the existing section 3.7-1 Bicycle Facilities in the Street Design Standards by increasing the number of facilities available for selection and improving clarity in design aspects of bike lanes. This is the City's implementation of best practices from organizations like NACTO and AASHTO.

The Quick Build Guide will provide guidance for the implementation, materials, and design of projects that are meant to be installed quickly or use materials that are more cost-friendly to test traffic revisions that are more experimental or new to Spokane. This is a new document to the City but many other cities across the US and even WSDOT has their own Quick Build guide.

The Vision Zero Safety Action Plan update is an update to the City's 2023 Vision Zero Action Plan which helped the City obtain the Safe Streets 4 All federal grant. This document assesses the city's current transportation landscape- identifying where there is a high risk of traffic incidents and what systemic solutions can mitigate those risks. The results are an analysis of crash data, a high injury network, and countermeasures for future grant funding.

Background:
The City applied for a Safe Streets 4 All grant in 2023 and was awarded $9.6 million. Approximately $360,000 of this was for supplemental planning, which includes the three main elements mentioned above. Project initiation was in early 2026 and is expected to be complete in early 2027.

Relationship to Plans/Actions:
Street Design Standards and the Vision Zero Action Plan are being updated through this project. The only new document is the Quick-Build Guide which complements the goal of implementing safe bicycle infrastructure in a timely manner.

Timeline/ Further Action:
We are asking the Bicycle Advisory Board to provide feedback on the documents either during the October meeting or by their November meeting. Feedback may be incorporated into the planning documents and presented to Transportation Commission at their November meeting.

For further information contact: Tyler Kimbrell, tkimbrell@spokanecity.org

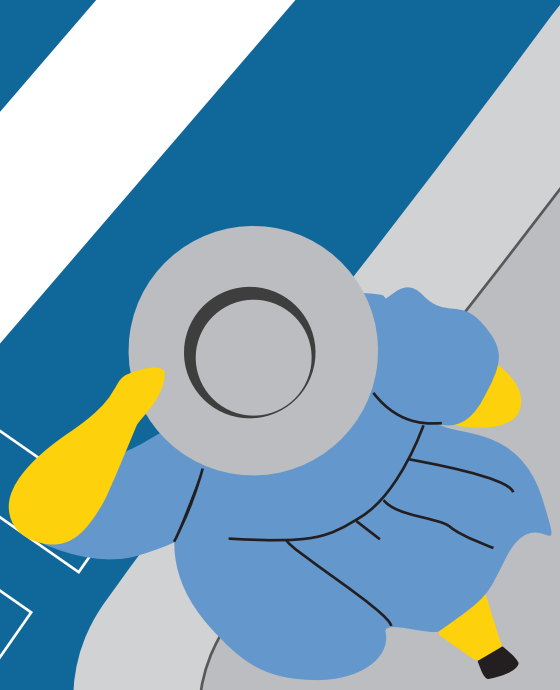
AGENDA

City of Spokane

SAFE STREETS

VISION ZERO SAFETY ACTION PLAN





September 2026

AGENDA

Resolution No. 2022-0107

In support of a goal to eliminate fatalities and serious injuries on city streets

A resolution committing to a goal to achieve zero traffic fatalities and serious injuries among all road users (including people walking, biking, using transit, and driving).

WHEREAS, the City of Spokane's Comprehensive Plan (2019), Spokane Downtown Plan (2021), Bicycle Plan (2017) and Pedestrian Plan (2015) all seek to reduce serious or fatal pedestrian and bicycle injuries; and

WHEREAS, as stated in Spokane City Bicycle Master Plan Policy BMP 2: Complete and maintain connected bikeways that provide safe transportation for Spokane cyclists throughout the City, BMP 4: Enhance the safety of people riding bicycles through detailed crash analysis, BMP 5: Develop a collaborative program between a variety of city departments and agencies and outside organizations to implement the Bike Master Plan through capital project delivery as well as community planning processes; and

WHEREAS, Vision Zero is a holistic strategy aimed at eliminating all traffic fatalities and serious injuries suffered by all road users in Spokane while increasing safe, healthy, and equitable mobility for all;

WHEREAS, similar efforts are founded on a Safe Systems approach that recognizes humans will make mistakes and roadway systems and policies should be designed to protect them; and

NOW THEREFORE, BE IT RESOLVED that the Spokane City Council adopts a goal to eliminate traffic deaths and serious injuries within the set timeframe of 2042, and adopts the analysis provided by the City's Local Road Safety Risk-Based Analysis as the City's Safety Action PLan.

Adopted by the City Council this 12th day of December, 2022.

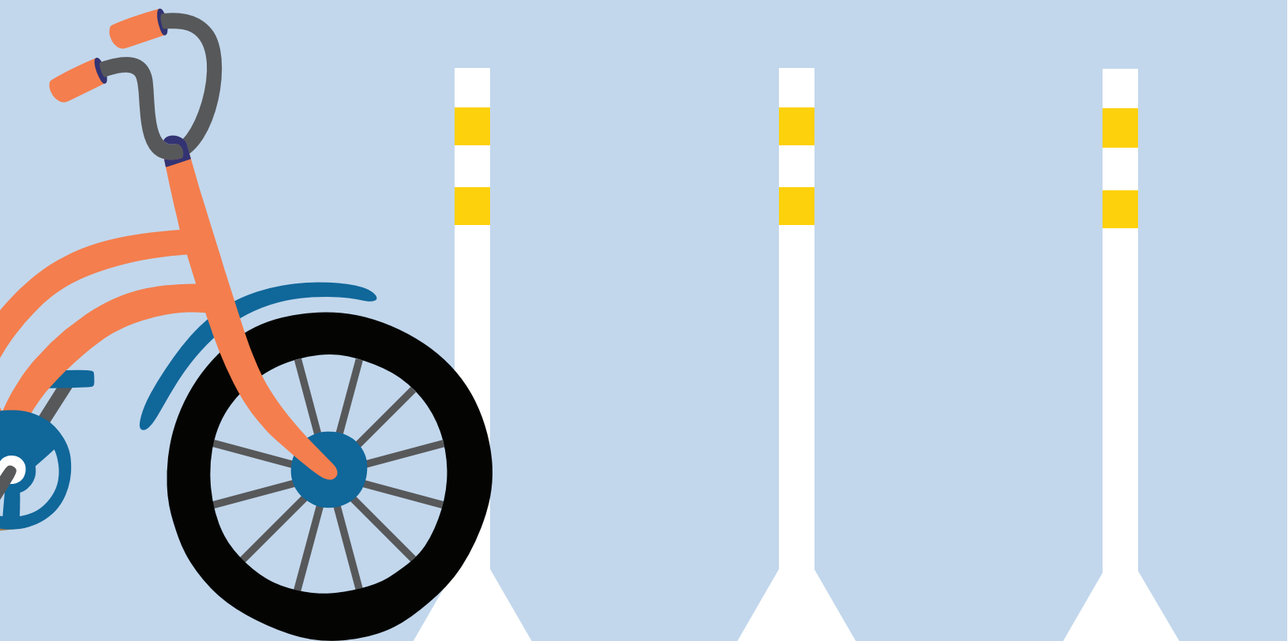


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- Keep updated

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It takes **everyone** to make streets safer



Spokane is falling behind the rest of the U.S. in road safety.

Across the U.S., traffic deaths and serious injuries have dropped more than 15% over the past five years. In Spokane, they are rising. Last year, pedestrian fatalities in our city hit an all-time high.

Roadway safety is a citywide issue in Spokane—it's not just a few bad spots or bad actors. Fatal and serious-injury crashes dot the map of our city, from Airport Drive all the way north to Indian Trail Road, and the people involved come from all walks of life. It's time to take action.

This problem affects everyone, and everyone has a part to play in solving it.

The City's goal is to eliminate traffic deaths and serious injuries on our streets by 2042, and we need your help. Safe Streets for Spokane is part of the City's ongoing commitment to roadway safety. This plan coordinates the efforts of City staff, policymakers, advocacy groups, and the public in pursuit of our shared goal.

The guiding framework for this plan is the U.S. Department of Transportation's Safe System Approach. This approach recognizes that humans are vulnerable and that we make mistakes. Within a Safe System, multiple layers of protection are put in place to prevent crashes and minimize harm to human lives when prevention efforts fail. Everyone works together to create a safe transportation system.

It's about creating the city we want.

Spokane's leadership is working on several initiatives to rebuild a dense and vibrant city with more housing. A safe, multimodal, and accessible transportation system is essential to that vision. Safe Streets for Spokane focuses on making sure people of all ages and abilities can get around the city safely and conveniently.

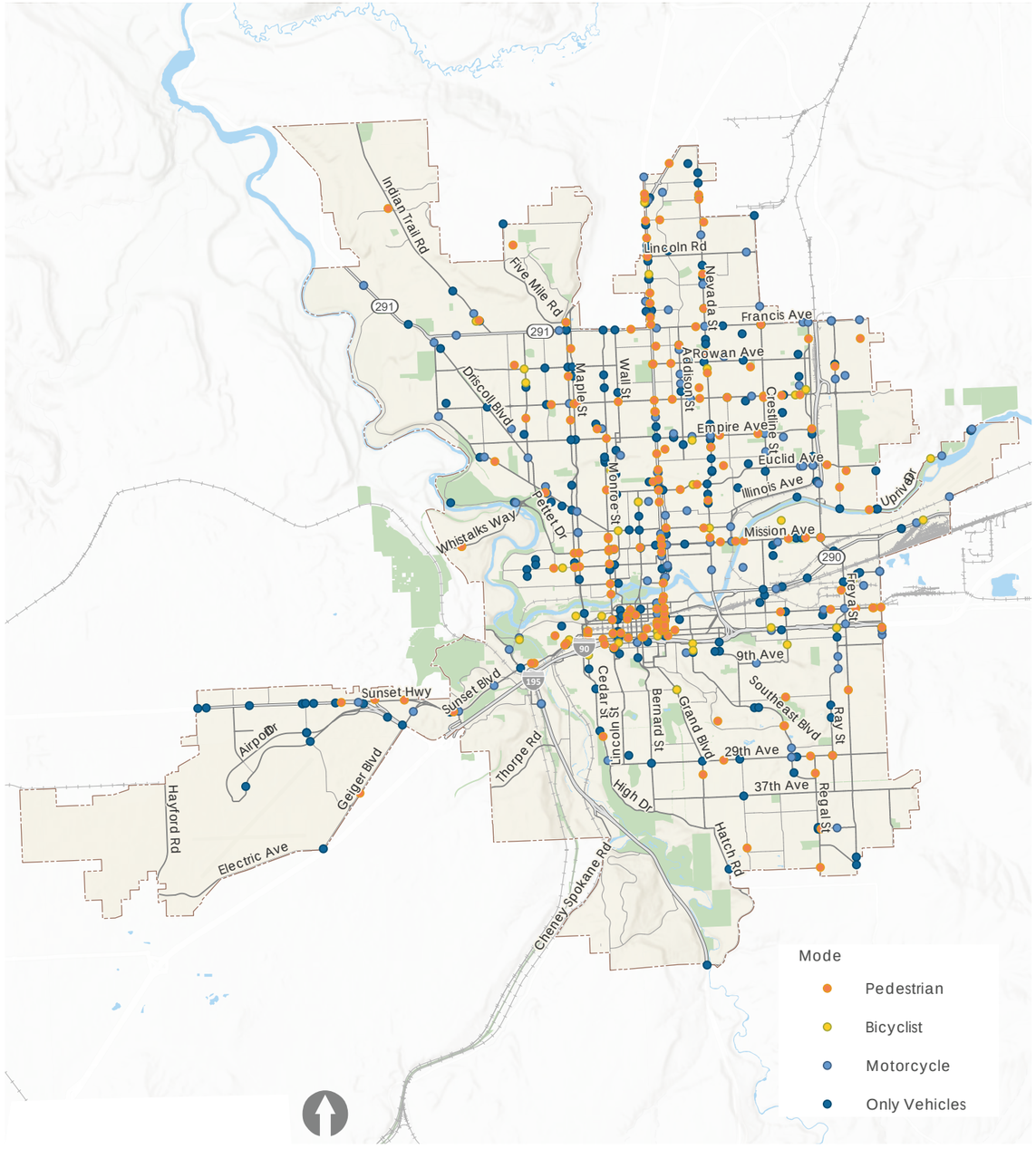
Increasing roadway safety for all modes also creates a more efficient system, reducing the social and economic impacts of crashes and delay for all road users.

Together, we can make this vision a reality.

This plan was created in collaboration

with City staff, agency partners, and a Technical Advisory Committee representing transportation, planning, transit, and community interests. Participants reviewed goals, crash analysis results, the High Injury Network, priority projects, proposed countermeasures, and draft recommendations to ensure alignment with community interests.

Fatal and Serious-Injury Crashes (2021-2025)



What **the data** tells us

Understanding where serious crashes are happening and who is involved reveals specific opportunities where the City can act to improve roadway safety.

Spokane's rise in serious crashes is concentrated among vulnerable roadway users, like people walking, biking, or riding motorcycles; a few high-risk roadway types; and a limited number of high-crash locations throughout the city, according to crash data from the past five years (2021-2025). The following pages highlight these trends.

Chapter 5: Taking action, on p 21, shows how we translated this data into targeted projects.

The total number of crashes is trending down, but serious crashes continue to rise.

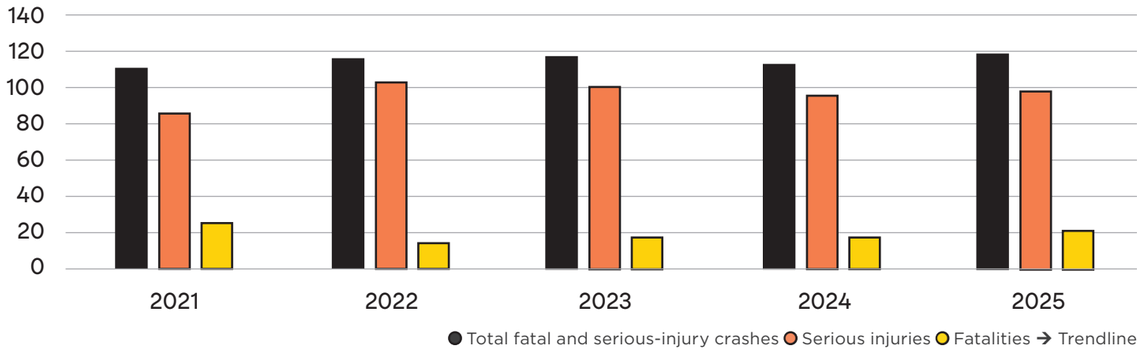


16,970
crashes happened between 2021 and 2025



581
caused life-altering injuries, including **97 fatalities**

Fatal and serious-injury crashes per year (2021-2025)



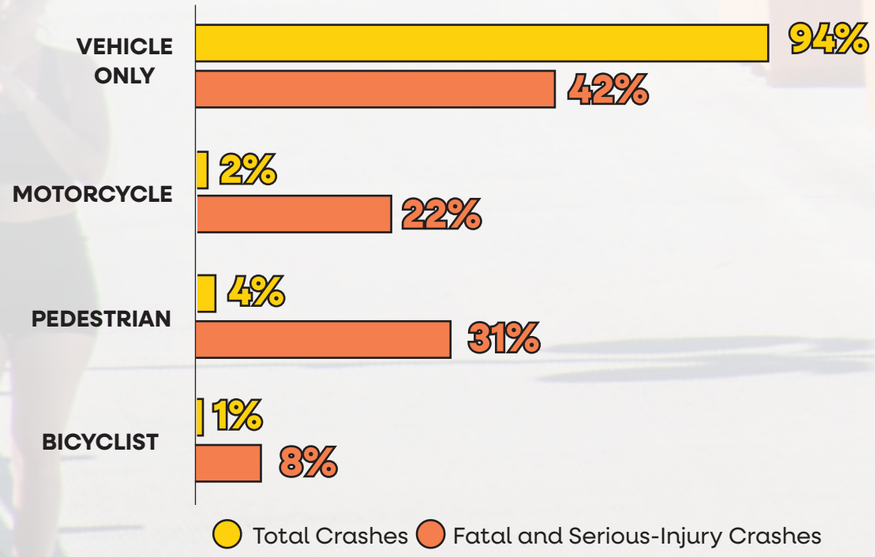
Vulnerable roadway users, particularly people on foot, face the highest risk of injury.

Pedestrian-involved crashes have been increasing over time, highlighting a safety concern for vulnerable road users.

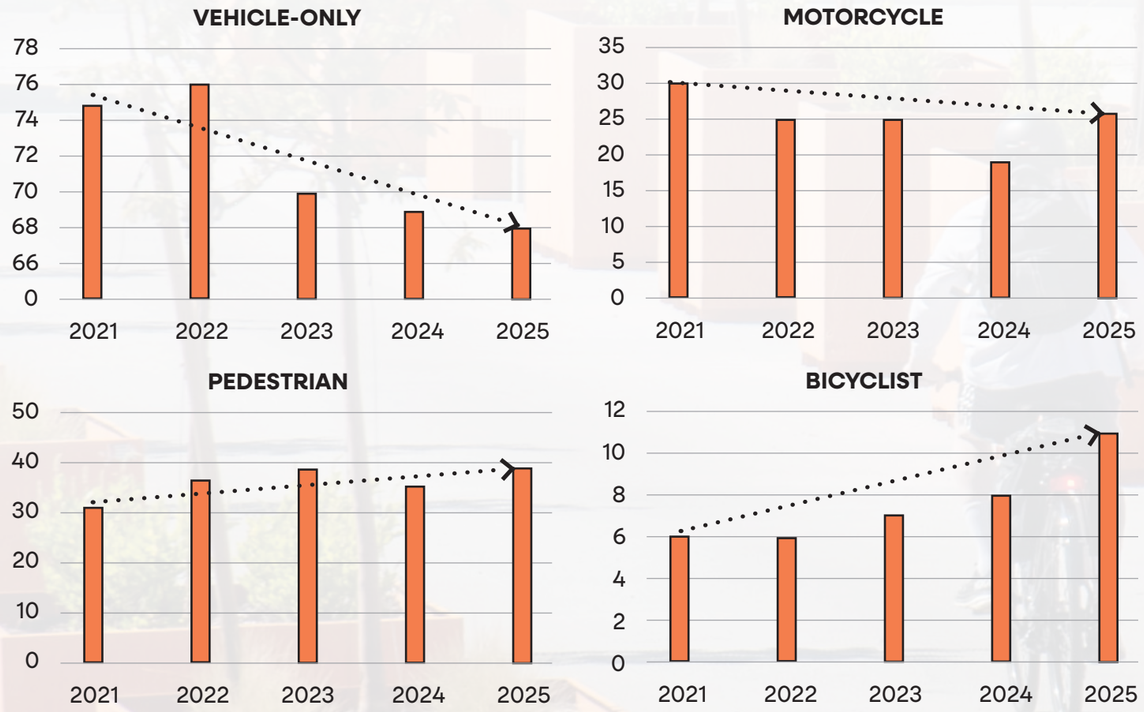
Nearly **1 in 4 pedestrian crashes** and **1 in 3 motorcycle crashes** resulted in a fatal or serious injury

Vehicle-only fatal and serious-injury crashes are **not falling**, despite a decrease in total number of crashes.

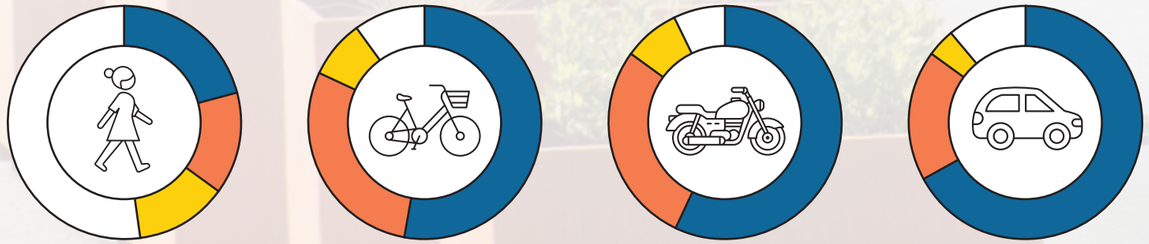
Crashes involving pedestrians, bicyclists, and motorcyclists are far more likely to result in death or serious injury



Pedestrian and bicyclist deaths and serious injuries are on the rise in Spokane



When and how do serious crashes happen?



21% Crossing at non-intersection crosswalk

14% Crossing at intersection, no signal

13% Crossing at intersection with signal

53% Riding with traffic

29% Crossing or entering roadway

8% Riding against traffic

57% Angle crash

28% Run off road

8% Riding against traffic

67% Going straight

18% Making left turn

4% Negotiating a curve

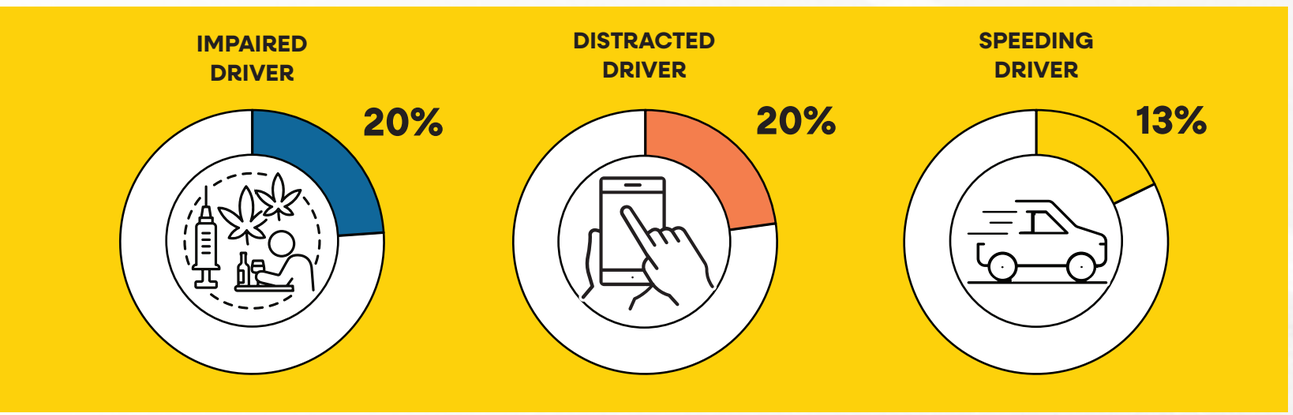
Human behavior plays a critical role in crashes.

Distracted driving, impairment, and speeding are key contributors to serious crashes.

Failure to yield is the single largest contributing factor, associated with over 25% of crashes that resulted in death or serious injury.

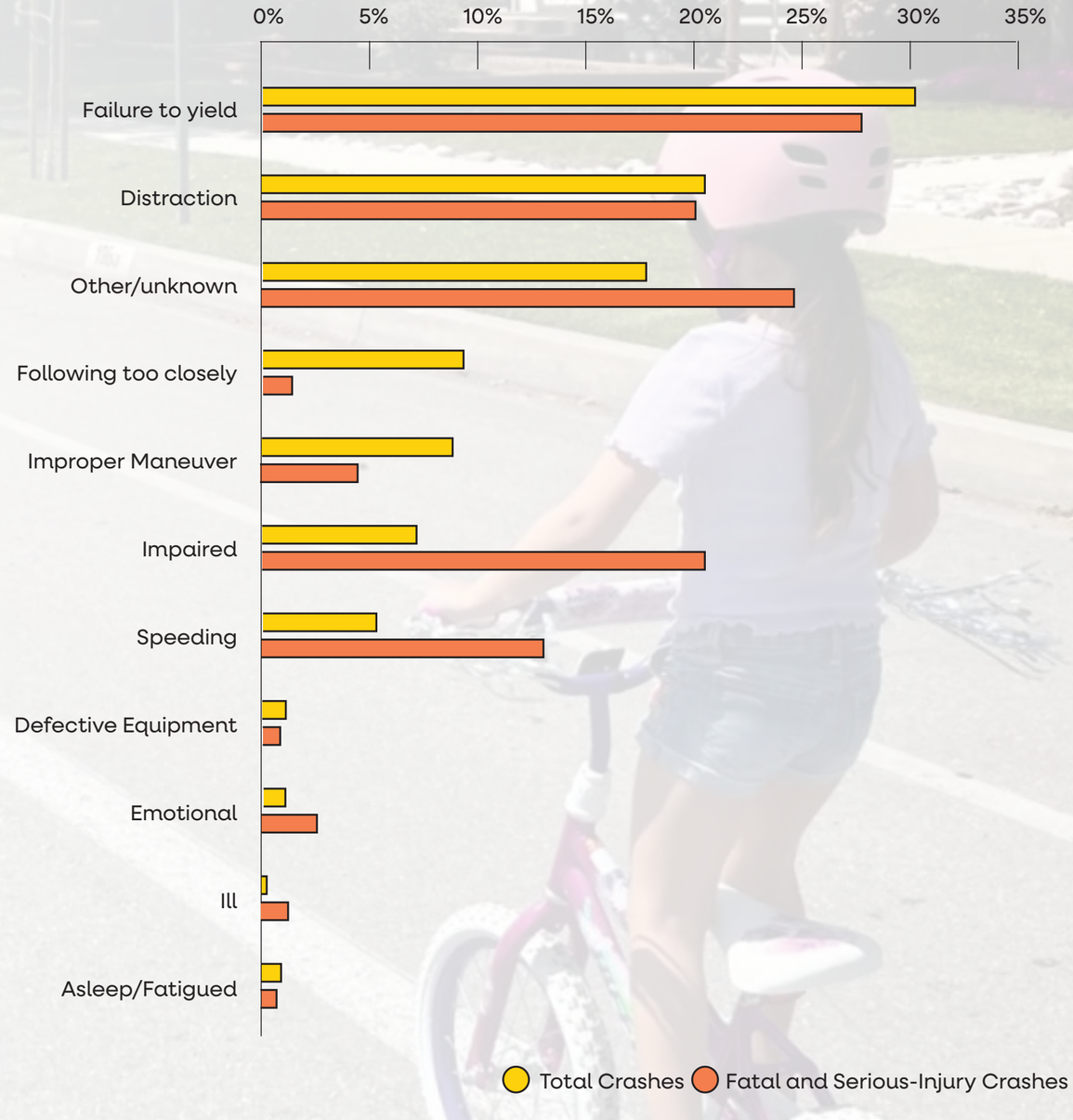
Crashes involving impaired drivers were disproprtionately likely to result in death or serious injury.

Impairment, distraction, and speeding are top contributors to serious crashes



Want more data? See the Vision Zero Crash Analysis Memorandum in Appendix A.

Which human behaviors contributed to the most fatal and serious-injury crashes?



Serious crashes are concentrated on a small portion of the transportation network.

A High Injury Network (HIN) was developed to identify corridors where the highest number of serious crashes are happening. The highest priority HIN locations are called out on the map. The City will target high-impact safety investments at these locations.

Roadways with 5+ lanes and 3 or 4 lanes have the highest risk for serious crashes along the City's network.

For example, 6% of fatal and serious-injury crashes have been on roads with 5 or more lanes, but 0.8% of the roadway network has more than 5 lanes.

48% of fatal and serious-injury crashes have been on roads with posted speeds of 30, but only 14% of the roadway network has posted speeds of 30.

Of the total land area within the city, 21% falls within an area of persistent poverty. However, 45% of fatal and serious-injury crashes, and 66% of the HIN Corridors fall within these areas.



Top 5 all modes HIN (all modes)

	Street Name	From	To	All Crashes	FSI* Crashes	Length (miles)	Severity Score	Bike HIN	Ped HIN
1	Browne St	Spokane Falls Blvd	7th Ave	144	4	0.7	690	●	●
2	Walnut St	Riverside Ave	7th Ave	35	4	0.5	614		●
3	Division St	Cleveland Ave	Spokane Falls Blvd	294	12	1.7	583		●
4	Ruby St	North River Dr	Cleveland Ave	316	11	1.5	551		●
5	Riverside Ave	Monroe St	Division St	82	5	0.7	538		

*Fatal and serious injury

Top 5 HIN intersections (all modes)

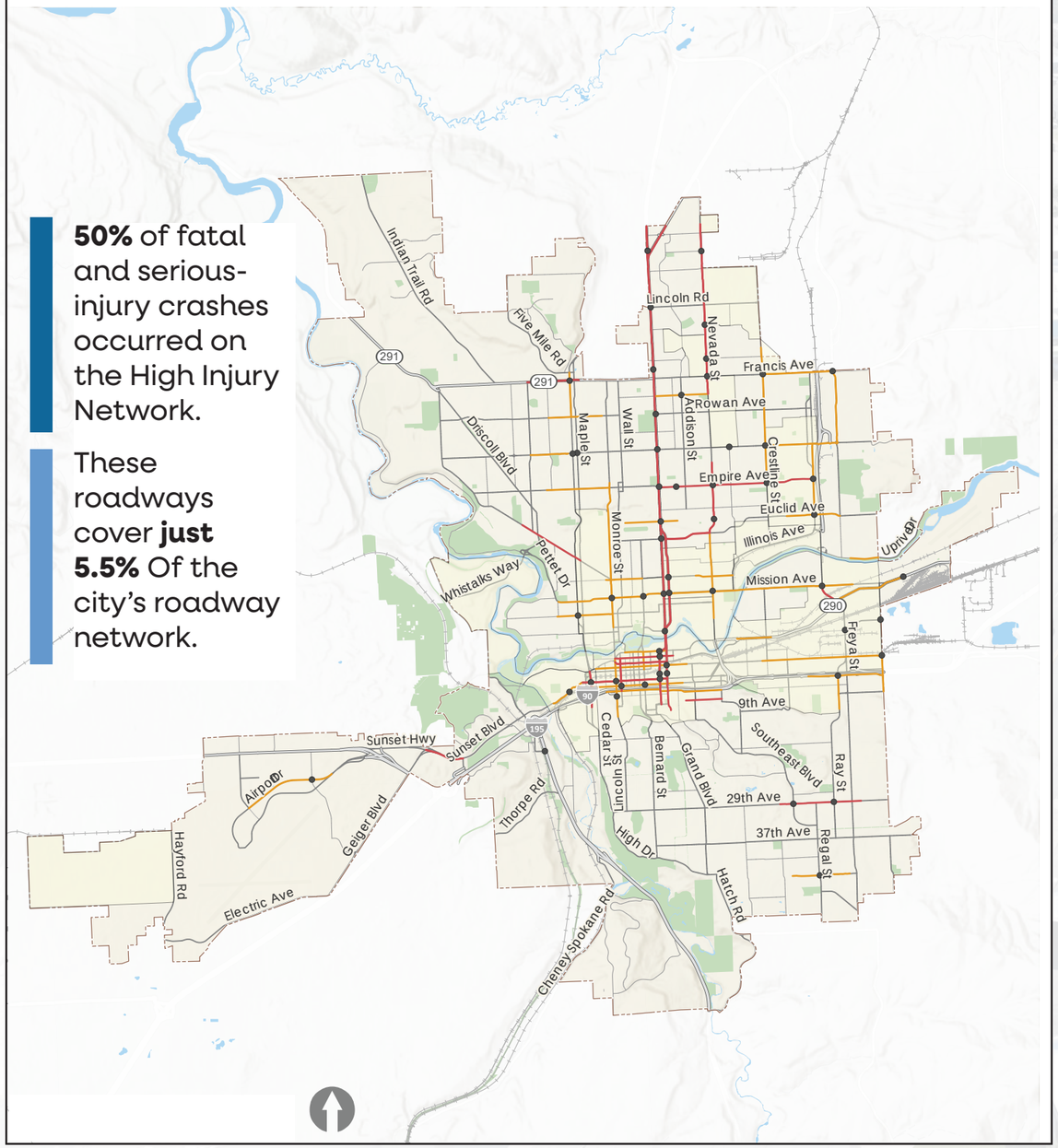
	Intersection	All Crashes	FSI* Crashes	Severity Score
1	Greene St / Mission Ave	77	3	237
2	Division St / Foothills Dr / Buckeye Ave	71	3	227
3	Monroe St / 2nd Ave	54	3	223
4	Freya St / Francis Ave	26	4	214
5	Division St / Euclid Ave	23	4	204

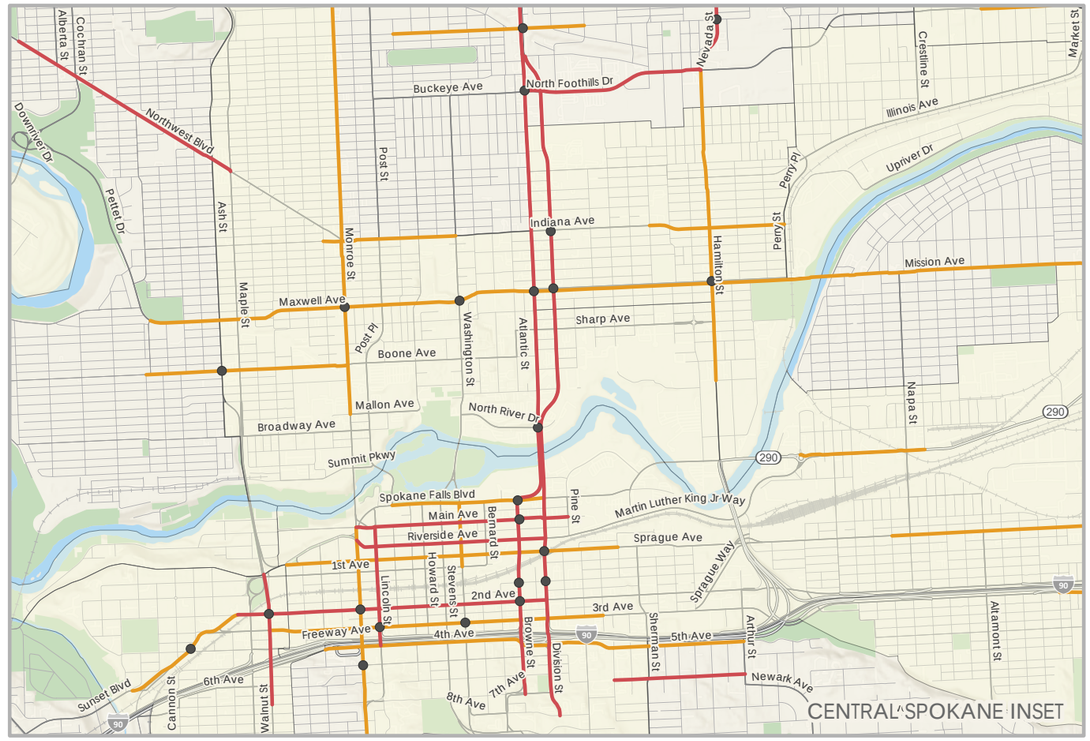
*Fatal and serious injury

The High Injury Network (all modes)

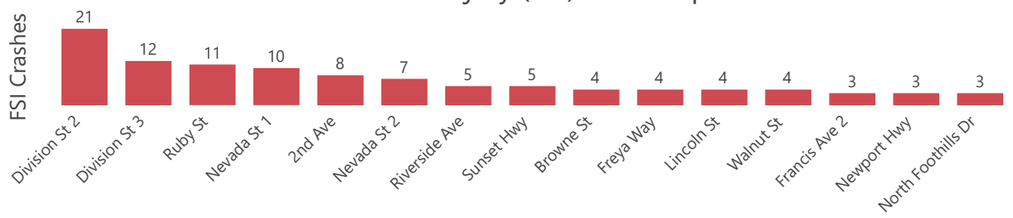
50% of fatal and serious-injury crashes occurred on the High Injury Network.

These roadways cover **just 5.5%** Of the city's roadway network.





Fatal and Serious Injury (FSI) Crashes per Corridor



HIN Corridors
- Primary
- Secondary

HIN Intersections

Areas of Persistent Poverty (S1701)





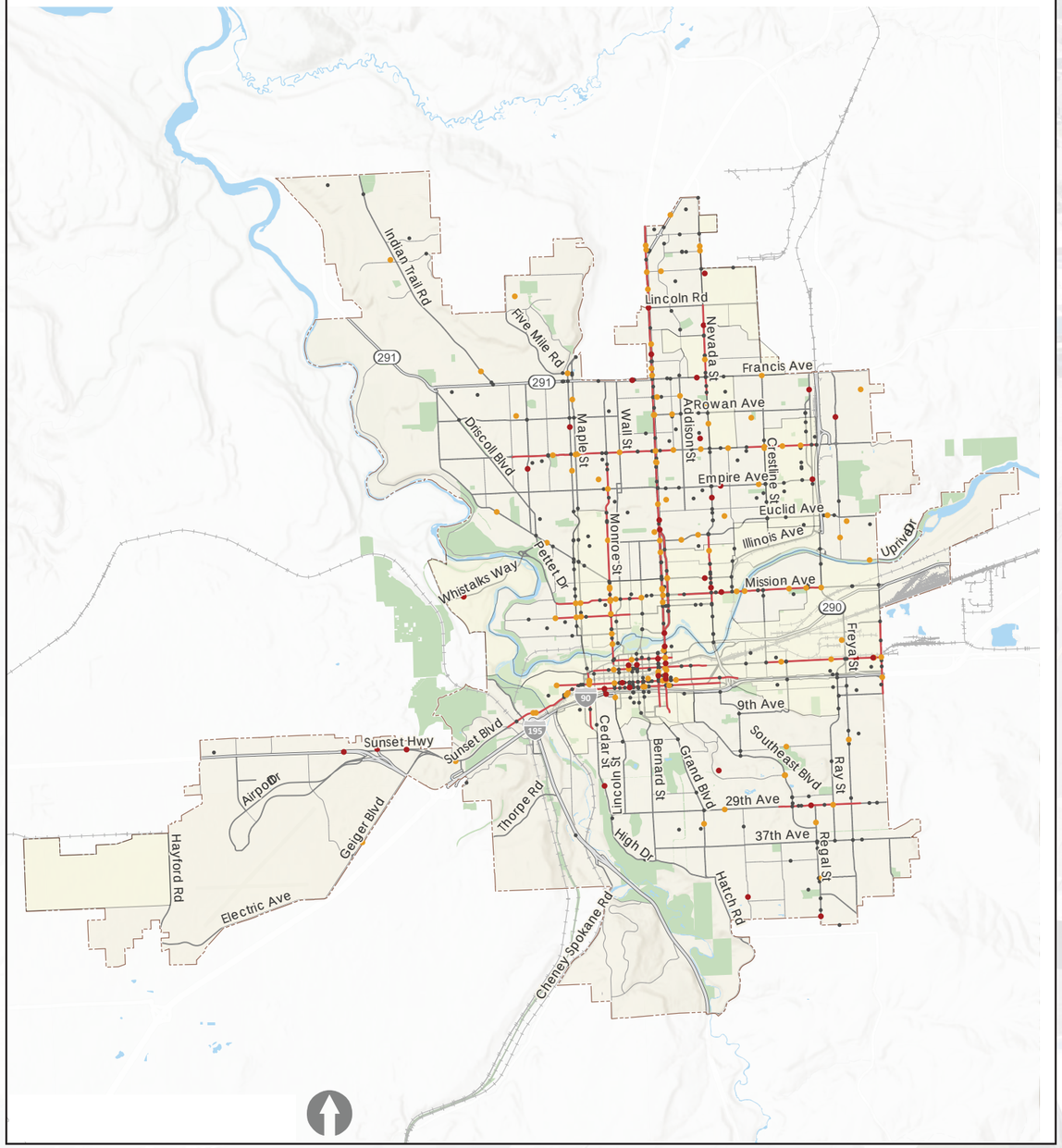
Top 10 HIN corridors (pedestrian)

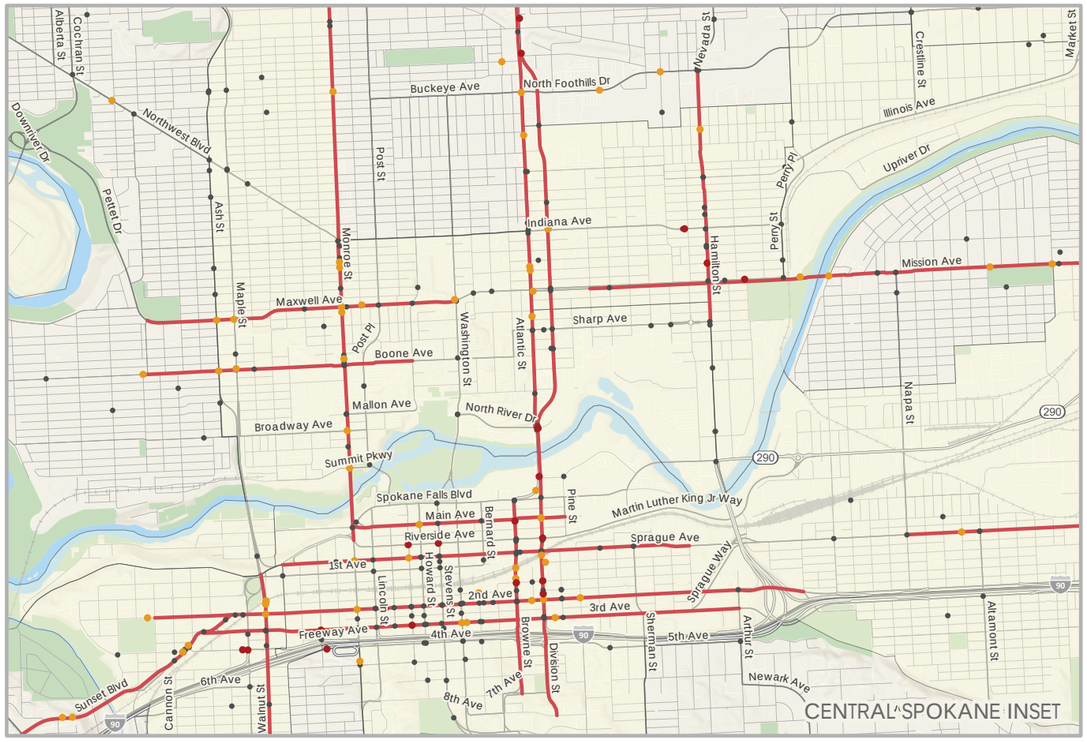
	Corridor	From	To	All Pedestrian Crashes	Pedestrian FSI* Crashes	Length (Miles)	Severity Score	All Mode HIN
1	Browne St	Spokane Falls Blvd	7th Ave	27	4	2.5	698	●
2	Division St	8th Ave	North River Dr	30	10	5.7	539	●
3	2nd Ave	Perry St	Chestnut St	59	6	1.1	451	●
4	Sprague Ave	Scott St	Cedar St	19	2	0.7	244	●
5	3rd Ave	Sunset Blvd	Arthur St	25	5	2.8	243	●
6	Maxwell Ave	Belt St	Washington St	14	5	2.1	218	●
7	Monroe St	Heroy Ave	Riverside Ave	26	8	2.2	187	●
8	Sunset Blvd	2nd Ave	Rosamond Ave	11	3	1.6	186	●
9	Walnut St	11th Ave	Riverside Ave	7	4	1.2	180	●
10	Wellesley Ave	A St	Lidgerwood St	21	6	2.0	178	●

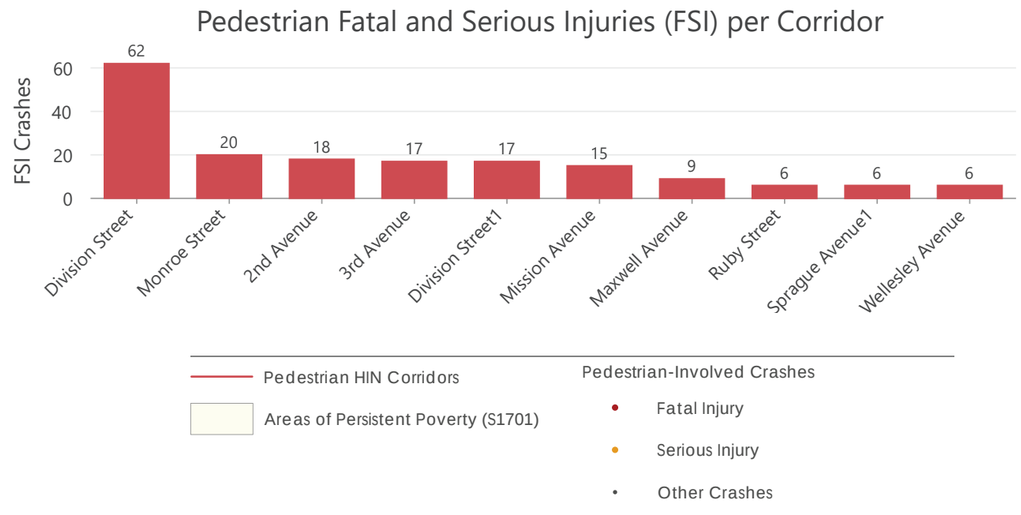
*Fatal and serious injury

Want more data on pedestrian crashes? See the Vision Zero Crash Analysis Memorandum in Appendix A.

The Pedestrian High Injury Network









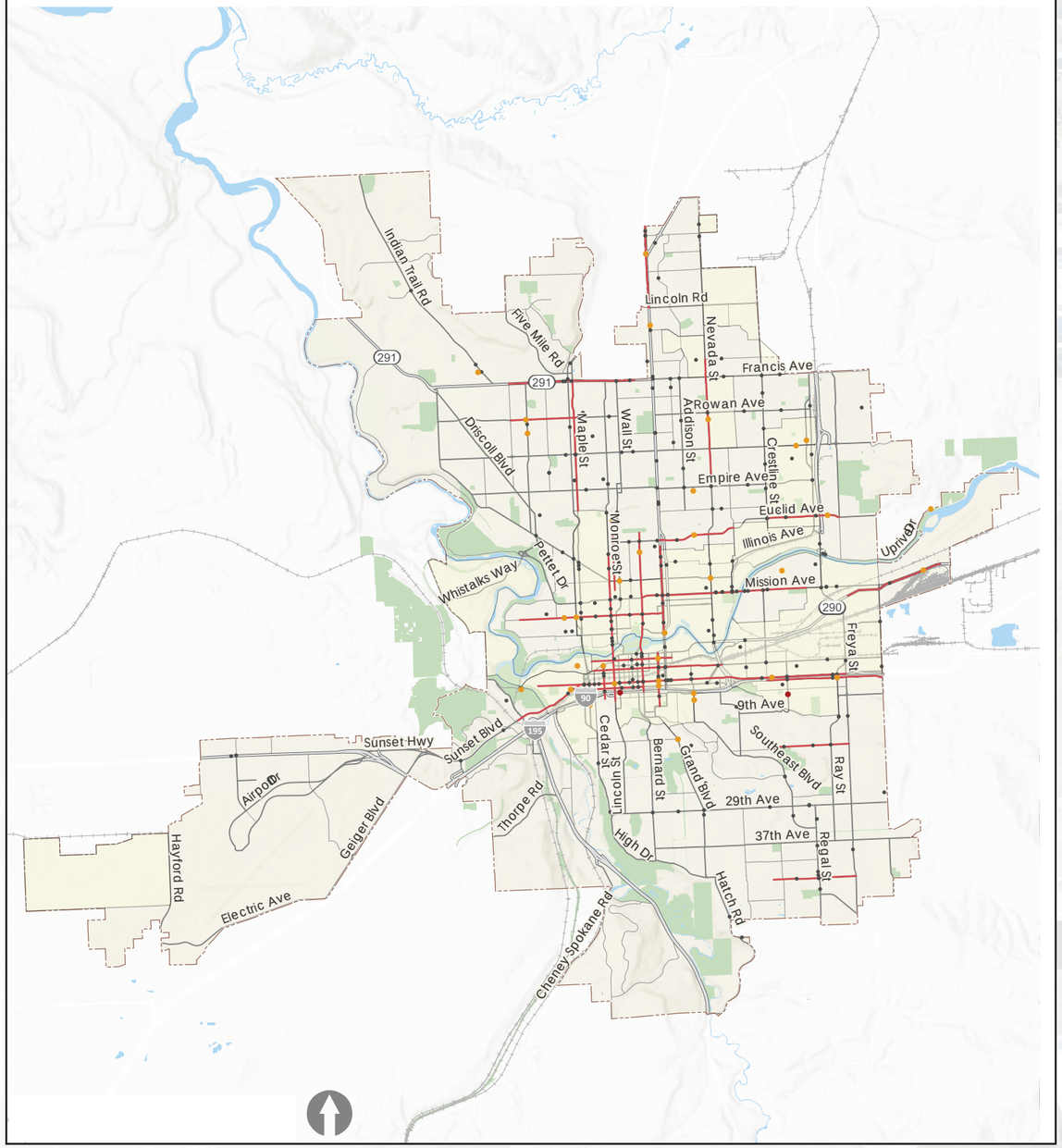
Top 10 HIN corridors (bicyclist)

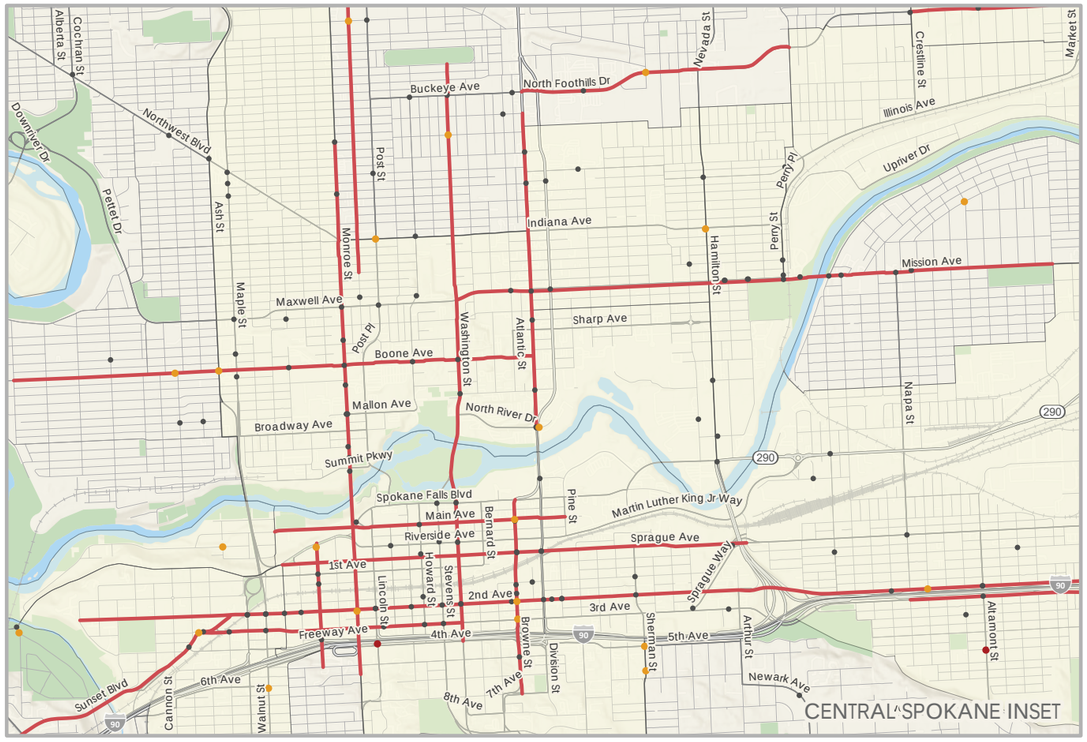
	Corridor	From	To	All Bicycle Crashes	Bicycle FSI* Crashes	Length (Miles)	Severity Score
1	Browne St	Spokane Falls Blvd	7th Ave	11	3	0.7	**269**
2	Jefferson St	5th Ave	Riverside Ave	4	1	0.3	**127**
3	2nd Ave	Freya St	Coeur d'Alene St	28	2	0.5	**117**
4	Mission Ave	Regal St	Washington St	12	0	4.3	**96**
5	Monroe St	Jackson Ave	Bishop Ct	11	1	2.3	**88**
6	Division St	York Ave	North River Dr	6	0	2.0	**83**
7	3rd Ave	Sunset Blvd	Washington St	5	0	1.2	**80**
8	Division St	Westview Ave	Lincoln Rd	4	1	1.0	**71**
9	Washington St	4th Ave	Waverly Pl	8	1	1.1	**63**
10	Boone Ave	A St	Division St	6	2	2.2	**60**

*Fatal and serious injury

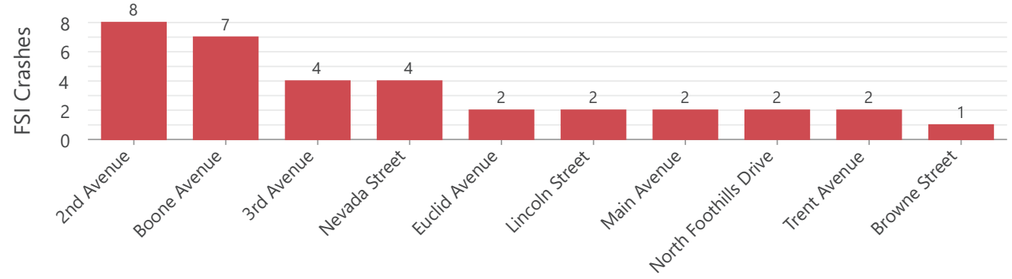
Want more data on bicyclist crashes? See the Vision Zero Crash Analysis Memorandum in Appendix A.

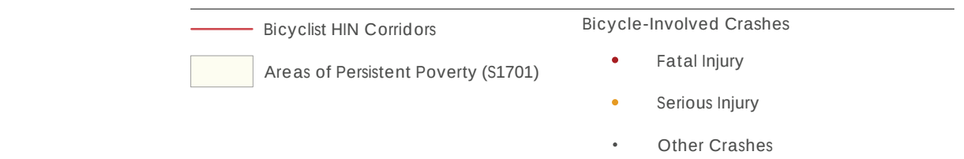
The Bicyclist High Injury Network





Bicyclist Fatal and Serious Injury (FSI) Crashes per Corridor





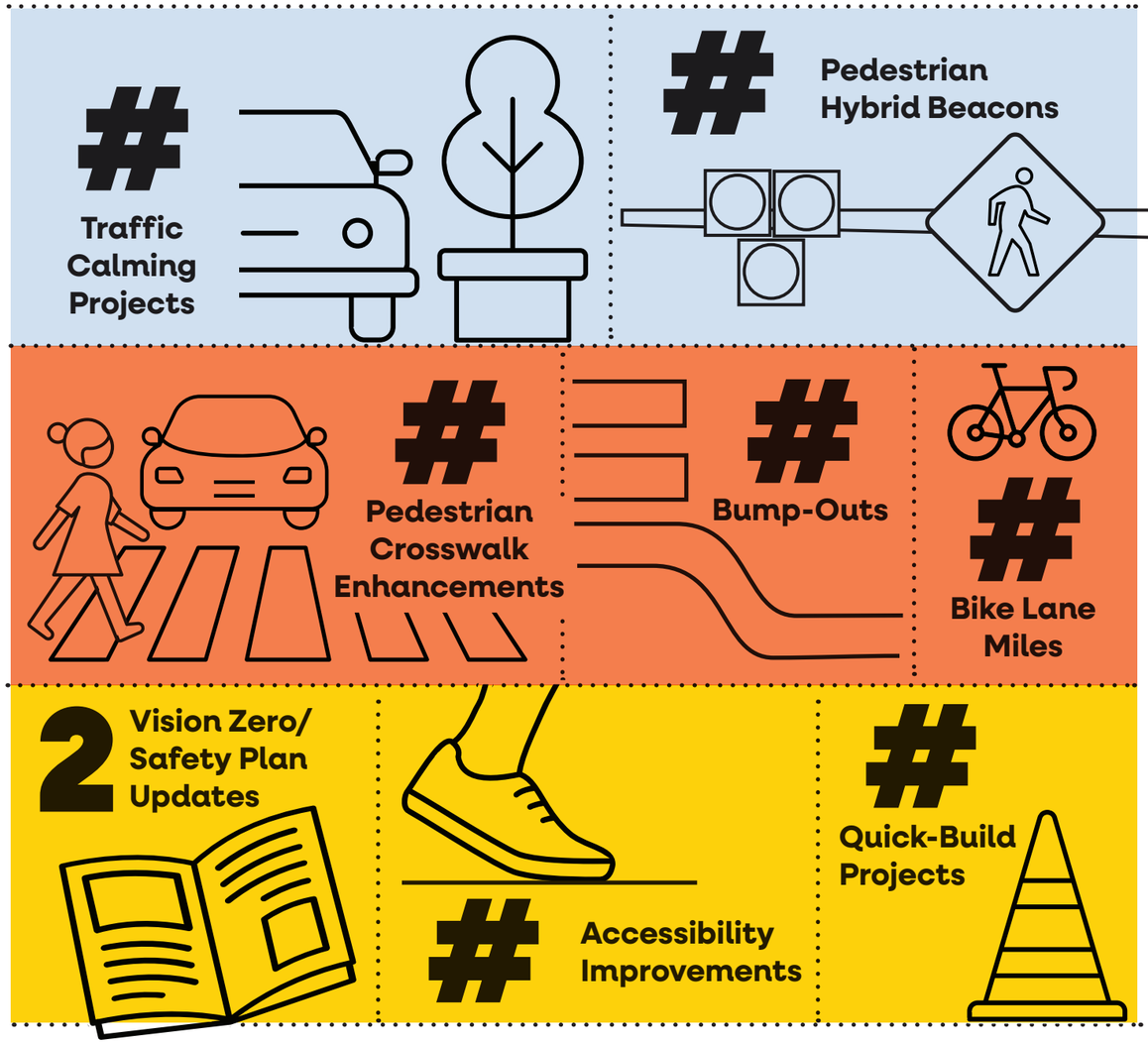
Already headed in the **right direction**



Source: Kittelson & Associates, Inc.

What the City has been doing to make roads safer

Since the first edition of the Safe Streets for Spokane Vision Zero Plan was released in 2023, the City and broader community have been laying a solid foundation for our goal of zero traffic deaths or serious injuries by 2042.



Project spotlight:

A refuge for people walking and riding bikes on Lincoln Street

This project enhanced bicycle and pedestrian infrastructure along Lincoln Street from Summit Parkway to Sinto Ave. Improvements include buffered and protected bike lanes, widened sidewalks, a grind-and-overlay from Summit Parkway to Boone Avenue, and a new signal at the intersection of Lincoln St. and Broadway Ave. The project was completed in September 2025.



New Spokane Emergency Streets Pilot Program

The Emergency Streets program brings rapid, temporary traffic calming treatments to the site of a fatal crash within 48–72 hours. The goal is simple: increase awareness, reduce speeds, and make streets safer right away. Community engagement is a key part of the pilot. Residents near Emergency Street (fatal crash) treatments receive notification materials that. include a link to a survey. Learn more at https://www.emergencystreets.org/partner-cities.

Taking action

The City has developed a set of strategies and actions to make progress toward eliminating fatal and serious injury crashes for people driving, riding motorcycles, walking, rolling, and cycling. The recommended strategies are informed by the crash analysis, High Injury Network (HIN), agency plans and policies, and notable best practices from the region and across the U.S. They also align with the Safe System Approach, which considers five elements of a safe transportation system: safe road users, safe vehicles, safe speeds, safe roads, and post-crash care.

Priority Projects

The City identified 10 priority corridors. Corridor Profiles were developed for each one to provide an overview of the crash history and potential solutions to mitigate crashes (See Appendix A). The profiles are intended to support future funding applications and guide the application of similar solutions on corridors with comparable characteristics.



Citywide strategies and actions

The table below identifies strategies that can help the City advance toward zero traffic fatalities and serious injuries through actions that can be tracked over the life of this plan.

Action	Measuring Progress	Timeline
Physically separate vulnerable users (pedestrians and cyclists) from traffic using FHWA Proven Countermeasures to improve mobility for all users.	# of separated facilities	Ongoing
Continue to expand bicycle facilities to reduce interactions, conflicts, and crashes between bicyclists and motor vehicles while supporting public health and local economic activity.	Miles of bicycle facilities added or upgraded	Ongoing
Continue efforts to improve pedestrian crossing safety. Clearly marked crossing locations can discourage midblock crossings, maintain traffic flow, and align with driver expectations.	# of crossing improvements completed	Ongoing
Continue preserving existing transportation infrastructure through maintenance and replacement of deteriorating assets to support safe and effective mobility for all users.	# of improvements made	Ongoing
Continue deploying automated enforcement systems at high-injury intersections and school zones to discourage red-light running and reduce vehicle speeds near schools. Automated enforcement Speed cameras have been found to reduce speed violation rates by nearly 50 percent, while red-light cameras reduce fatal red-light-running crash rates by roughly 20 percent.	# of cameras deployed	Ongoing
Evaluate speed limits on arterial and collector roadways to confirm they are appropriate, consistent, and supportive of the local context.	# of corridors evaluated	1 to 3 years
Continue to install signage and signal programming to prohibit right turns on red, eliminating a primary conflict between turning vehicles and pedestrians/cyclists in the crosswalk in high pedestrian volume areas and along the HIN.	# of NRTOR locations installed	1 to 3 years
Explore the installation of stop signs at high risk unsignalized intersections to reduce conflicts within neighborhoods.	# of intersections evaluated	1 to 3 years
Implement a comprehensive update to traffic signal operations and equipment:. • Retime signal progression signals to encourage drivers to travel at or below the target speed limit rather than accelerating between signals. • Upgrade signal controllers, cabinets, and communication equipment to support enhanced mobility and safety including: » Installation of Leading Pedestrian Intervals » Emergency vehicle preemption on arterial signals to lower risk of intersection crash and reduce response time and improve post-crash care. » Dedicated phases and separate signal heads for cyclists, particularly at complex intersections, to prevent right-hook and parallel path collisions. » Dedicated or protected turn phases to eliminate left-hook crash risks. » Emergency vehicle pre-emption (EVP) capabilities on traffic signals along key emergency response routes. • Include walk signals by default at HIN intersections. • Upgrade aging equipment with tactile arrows, vibrating surfaces, and audible tones that indicate exactly when and where to cross to protect disabled and visually impaired users.	# of LPIs installed # of turn phases installed # of APS upgrades completed # of EVP equipped intersections	4+ years
When resurfacing, rehabilitating, or reconstructing roadways on the HIN (or those with similar characteristics) utilize the FHWA Safe System Roadway Design Hierarchy to select and implement countermeasures that are proven to mitigate crash trends.	# of projects evaluated	Ongoing



Action	Measuring Progress	Timeline
Identify projects on HIN corridors and intersections using FHWA Safe System Roadway Design Hierarchy to identify applicable countermeasures to mitigate crash history.	# of new projects	Ongoing
Continue to prioritize active transportation safety improvements and speed management strategies in school zones in support of Safe Routes to School.	# of projects completed	Ongoing
Manage community traffic safety requests transparently, consistently, and equitably through the neighborhood traffic calming program.	# of project cycles completed	Ongoing
Monitor sight triangles at conflict points along the HIN, ensuring vegetation and other objects are not blocking views or encroaching in vehicle lanes, bicycle lanes, and sidewalks.	# of sight obstructions resolved	Ongoing
Continue to update and implement the traffic calming master plan.	# of projects added	Ongoing
Continue collaborating with STA on TOD planning efforts, with a focus on improvements that support multi-modal mobility to, from, and through transit corridors.	# of TOD projects advanced	Ongoing
Identify opportunities to designate and design shared streets that create shared public space, support walking and biking access, and strengthen connections to local businesses.	# of shared streets designated	4+ years
Develop a Safe Routes to School Master Plan.	Plan adopted	4+ years
Evaluate HIN corridors annually using Road Safety Audits to identify countermeasures to enhance safety for all modes.	# of RSAs completed # of recommendations advanced	Annual
Provide an annual Vision Zero progress report	Annual progress report published	Annual
Develop and implement targeted traffic safety communications campaigns that promote safer behaviors and build a shared culture of responsibility among people driving, walking, rolling, biking, and using transit.	# of campaigns launched	Ongoing
Support transportation options, including transit, that reduce overreliance on driving, reduce congestion, improve capacity, and reduce delay for vehicles, freight, and transit.	Mode-share change	Ongoing
Evaluate establishing a lower local road speed limit (20 MPH) city-wide. Explore a pilot study within the downtown area before establishing a city-wide change.	Pilot complete Policy adopted	1 to 3 years
Review the effectiveness of the pilot Traffic Fatality Review Team and consider extending the efforts permanently.	Policy adopted	1 to 3 years

Action	Measuring Progress	Timeline
Evaluate current e-mobility use and identify targeted policies, enforcement strategies, and infrastructure designs to improve safety for all modes.	Data gathered Policy adopted	1 to 3 years
Evaluate the use of smaller fleet vehicles to align with safer street designs.	Right-sizing review completed	1 to 3 years
Continue regular fleet maintenance and integrating safety technologies into City vehicles	# of vehicles upgraded	4+ years
Continue supporting the Traffic Safety Enforcement Unit's efforts to deliver targeted behavioral enforcement to reduce violations leading to crashes.	# of enforcement activities	Ongoing
Gather and analyze micromobility crash data to understand rider behavior and plan infrastructure enhancements to improve safety and reduce conflicts with all modes..	Data gathered	Ongoing
Explore the potential of a new user-friendly system or web-based dashboard for sharing traffic crash data with the public.	Webpage launched, quarterly updates	1 to 3 years
Partner with regional EMS providers, hospitals, and trauma centers to develop and launch a citywide prehospital blood transfusion program for trauma patients. Deploy training, equipment and supplies needed to provide prehospital blood transfusions.	# of partners with prehospital blood transfusion capabilities	1 to 3 years
Support changes to crash data reporting systems to better reflect all mobility options, including motorized foot scooters.	Data gathered	4+ years
Explore deployment of near-miss detection technology to improve data available for planning and design efforts.	Pilot locations identified	4+ years
Evaluate Emergency Streets Pilot Program as a full time program	Program adopted	1 to 3 years

Next Steps

The City has already been investing in a safer Spokane for many years. With the Safe Streets for Spokane Safety Action Plan, we now have a clear vision and goals and a list of actions we can take to realize them. We have also increased our eligibility for the funding we need to make all this happen. Our commitment to safety is clear and more trackable than ever before. This plan includes metrics of success the City will use to see if our actions are working. Linked to the objectives and strategies shown in the Safety Action Plan's first chapter, these metrics form a step-by-step roadmap to our goal of zero traffic deaths and serious injuries.

Measuring Our Progress

Tracking our progress is critical if we want to reach our Vision Zero goal. Every year/two years, between Vision Zero Action Plan updates, the City will release a report detailing the changes in crash history since the last report, and efforts completed or in progress.

Each report will also include a progress update on the individual action plan strategies. For full transparency on efforts the City has made during the report's timeframe, each action will be identified as either completed, in progress, or not started.





Conclusion

The Safe Streets for Spokane Safety Action Plan is a big step toward achieving the City's goal of zero fatalities and serious injuries on our roadways. Knowing which projects need to be funded first and which will have the most impact is key to making a difference that will be felt by everyone who lives, works, and spends time in Spokane.

For roads to be truly safer for everyone, everyone needs to pitch in. Keep up to date as we implement this plan by visiting us at [URL], sign up for alerts, and look out for opportunities to get involved.


CITY OF
SPOKANE
TM

Appendix A - Crash Data Analysis

AGENDA

Key Findings

This memorandum summarizes the citywide crash analysis for the City of Spokane covering 2021 through 2025, with a focus on fatal and serious injury crashes. The findings highlight key trends, contributing factors, and high-priority locations to support the update to the 2022 Vision Zero Safety Action Plan, inform the High Injury Network, and guide data-driven safety investments where they can have the greatest impact.

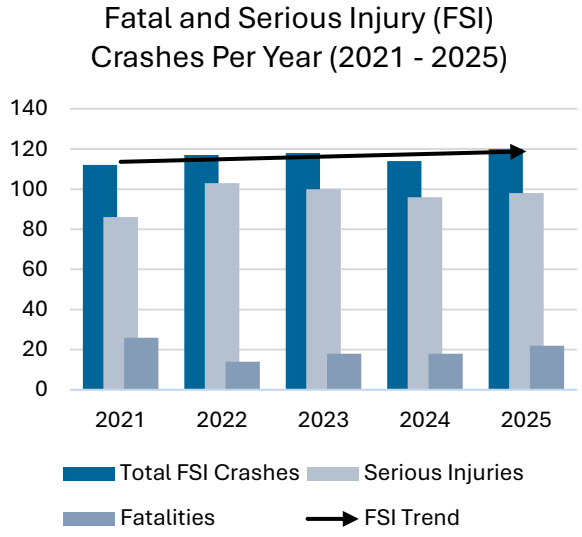
Severe traffic crashes in Spokane are increasing and are concentrated among vulnerable users (e.g., pedestrians, bicyclists, motorcyclists), a small number of high-risk roadway types, and a limited portion of the network. These results highlight **opportunities for targeted, systemic safety improvements.**

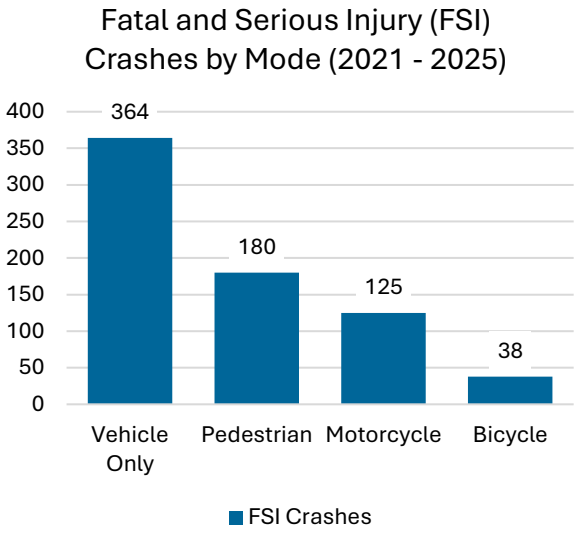
ALTHOUGH THE TOTAL NUMBER OF CRASHES ARE TRENDING DOWN, FATAL AND SEVERE CRASHES ARE CONTINUING TO INCREASE

- **16,970 crashes** occurred during the five-year period.
- Of those, 581 were fatal and serious injury crashes, of the total there were 98 fatalities.

VULNERABLE USERS, PARTICULARLY PEOPLE WALKING, FACE THE HIGHEST RISK OF INJURY

- Nearly 1 in 4 pedestrian crashes and 1 in 3 motorcycle crashes resulted in a fatal or serious injury.
- Pedestrian-involved crashes have been increasing over time, highlighting a safety concern for vulnerable road users





HUMAN FACTORS PLAY A CRITICAL ROLE IN CRASHES

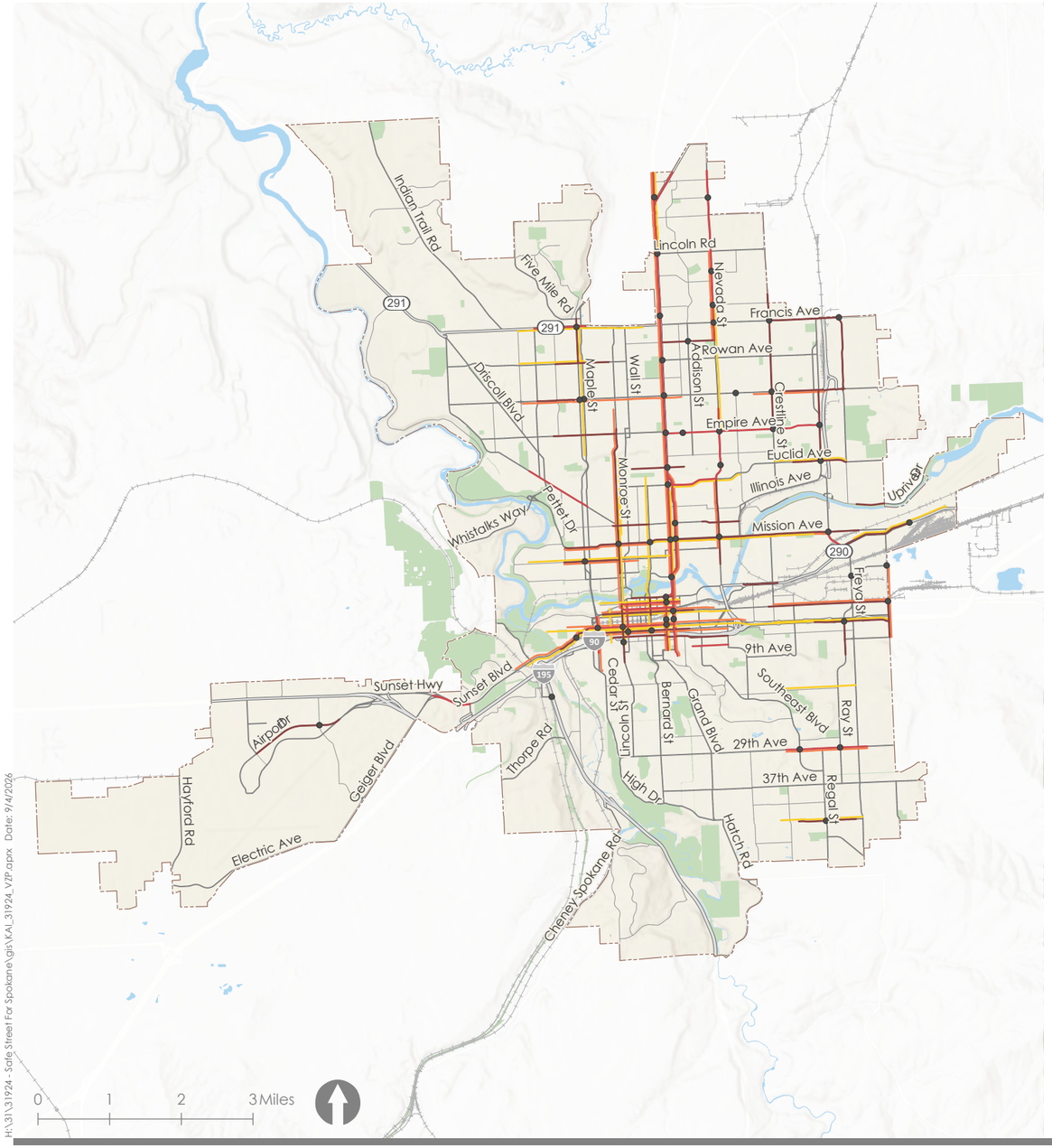
- **Failure to yield** is the single largest contributing factor, associated with over 25% of FSI crashes.
- Distracted driving, impairment, and speeding are also key contributors to FSI crashes.

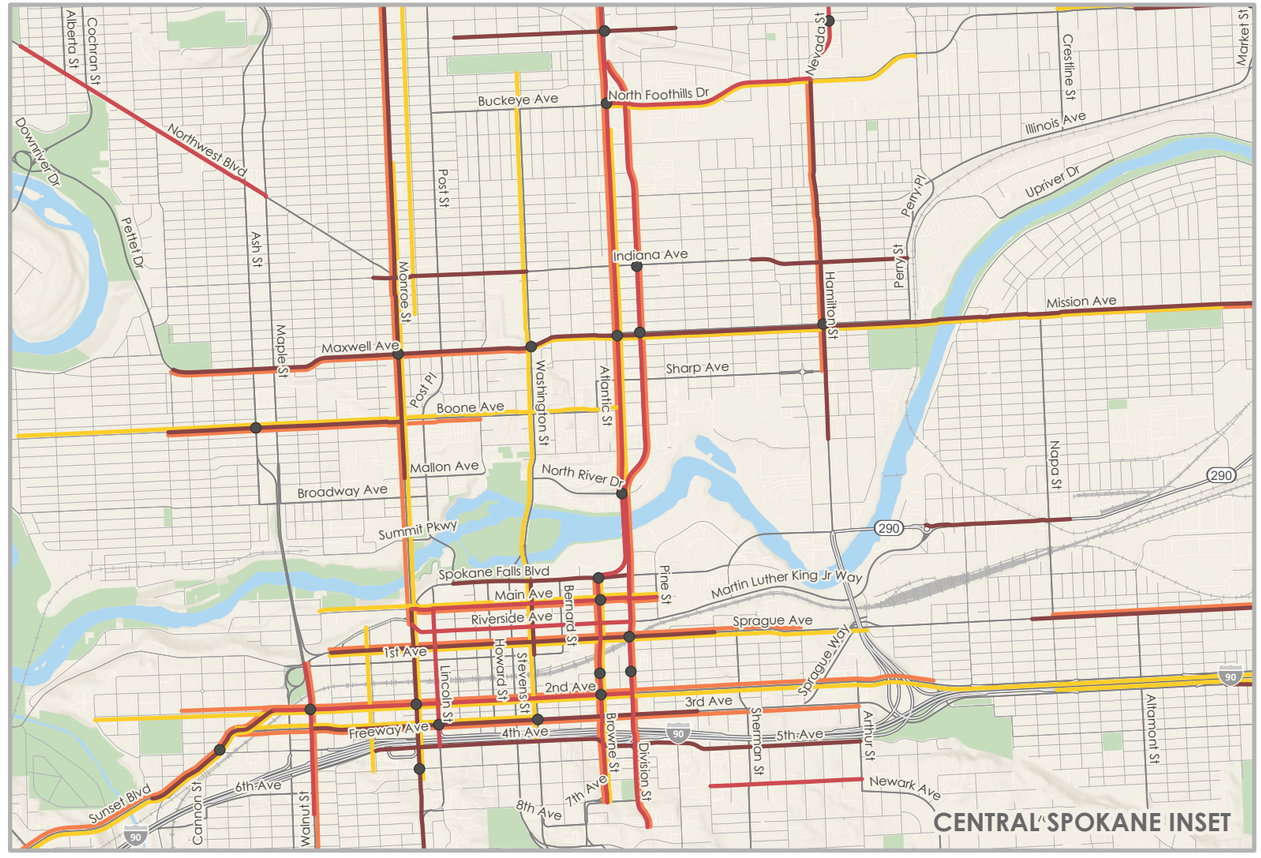
SEVERE CRASHES ARE CONCENTRATED ON A SMALL PORTION OF THE NETWORK

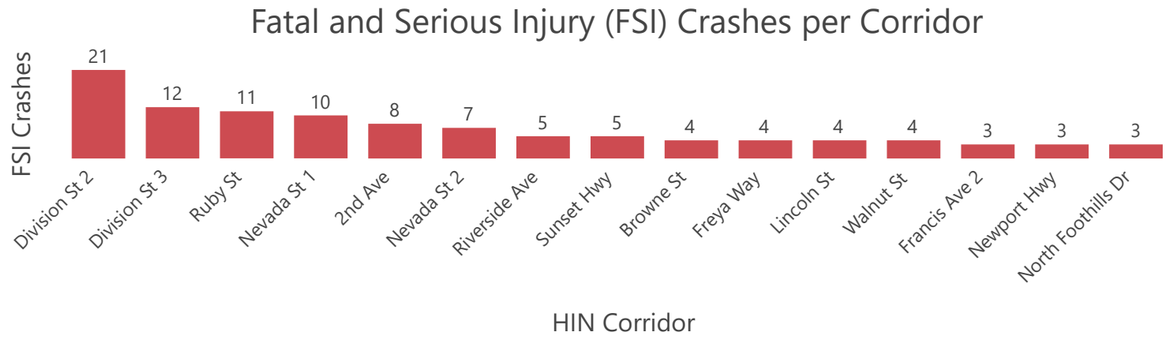
- The High Injury Network identifies corridors with elevated crash rates and a higher concentration of fatal and serious injury crashes (**Figure 1)**.
  - 51% of FSI crashes occurred just 58 miles of roadways, representing only 5.5% of the entire City's network.
- The top 15 priority locations (**Table 1**) represent opportunities for **targeted, high-impact safety investments**.

Table 1 Top 15 High Injury Network – Top 15 Locations

Corridor	From	To	All Modes	Bike Only	Ped Only	# of Intersections
Browne St	Spokane Falls Blvd	7th Ave	●	●	●	4
Lincoln St	4th Ave	Spokane Falls Blvd	●	●		1
Walnut St	Riverside Ave	7th Ave	●		●	1
Division St	Cleveland Ave	Spokane Falls Blvd	●		●	2
Ruby St	North River Dr	Cleveland Ave	●		●	3
Riverside Ave	Monroe St	Division St	●			0
2nd Ave	Sunset Blvd	Division St	●	●	●	3
Sunset Hwy	Airport Dr	Rustle Rd	●			0
North Foothills Dr	Division St	Hamilton St	●	●		1
Nevada St	Longfellow Ave	Hamilton St	●	●	●	2
Newport Hwy	Division St	Westview Ave	●			0
Francis Ave	Walnut St	Alberta St	●	●		1
Nevada St	Westview Ct	Central Ave	●	●	●	4
Division St	Westview Ave	Cleveland Ave	●		●	7
Freya Way	Misson St	Freya St	●			2







HIN Corridors

- Primary
- Secondary
- Pedestrian HIN Corridors
- Bicyclist HIN Corridors
- HIN Intersections

Figure 1

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All High Injury Networks (HIN)

Data Source: 2025 ACS 5-Year Estimates, Table S1701

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Introduction

This memorandum presents the results of a citywide crash analysis for the City of Spokane (City) covering the 2021 through 2025 study period, with an emphasis on fatal and serious injury crashes. The analysis identifies key crash trends, contributing factors, roadway characteristics, and locations with the greatest concentration of severe crashes.

These findings inform the update to the 2022 Vision Zero Safety Action Plan including development of a High Injury Network, which provides a data-driven foundation for prioritizing safety investments. This allows the City to focus resources where they can have the greatest impact and advance the City's broader commitment to reducing severe and fatal crashes.

Strategies to address eliminating fatal and serious injury crashes will be developed around the Safe Systems Approach.

The **Safe Systems Approach** recognizes humans will make mistakes and roadway systems and policies should be designed to protect them.

Analysis Overview

The crash analysis examines the previous 5 years of crash data to identify trends in crash frequency and severity and identify effective strategies and projects to address the highest priority areas. The analysis is comprised of four main components:

- **Crash Data Summary.** Provides an overview of crash trends, including the distribution of crash mode, crash type, weather and lighting conditions, and crash location.
- **Systematic Crash Analysis.** Identifies the human factor elements and other circumstances that contributed to a high percentage of fatal and serious injury crashes.
- **Systemic Roadway Context Assessment.** Assesses roadway characteristics (e.g., number of lanes, posted speed limits) that are present for a higher proportion of fatal and serious injury crashes.
- **High Injury Network (HIN).** Highlights intersections and segments with a history of frequent and/or high severity crashes.

Crash Dataset

Five years of crash data (2021 – 2025) within City limits was obtained from the Washington State Department of Transportation (WSDOT). The data provided included a total of 18,867 crashes and 308 variables. The initial WSDOT crash dataset was cleaned and standardized prior to analysis to improve data quality, reduce noise, and create consistent classifications. The following preprocessing steps were completed:

- 53 columns were removed that contained no data across all records.
- Duplicate crash reports were removed using the unique crash report identifier.
- Crashes were excluded that occurred on:
  - Interstate highways,
  - On and off ramps, and
  - Miscellaneous trafficways (e.g., private roads and parking facilities).
- Variable names were standardized and shortened for GIS analysis.
- Missing values were replaced by filling numeric count and indicator fields with zeros, and standardizing text fields to empty strings or "Other/Unknown" where appropriate.
- Field formats were cleaned and normalized to ensure consistency across records.

Table 2 provides the results of this data cleaning process.

Table 2. Inclusion Criteria for Crash Analysis Dataset

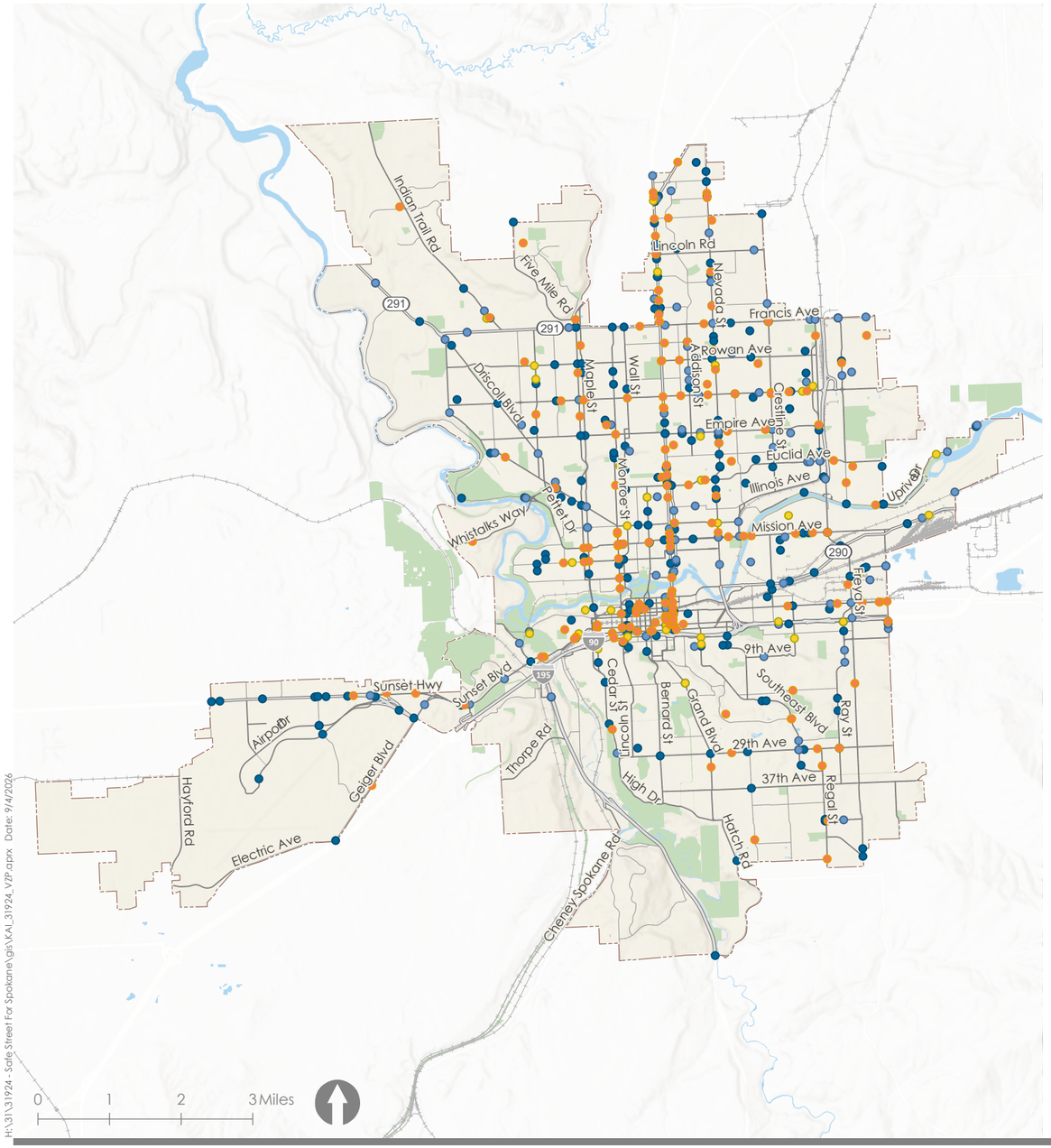
Inclusion Criterion	Explanation	# of Crashes Removed	# of Crashes Remaining
All crashes (2021 – 2025)	This is the complete data set provided by WSDOT.		18,867
Crashes did not occur on limited access facilities (I-90) or on an on-ramp or off-ramp	Interstates, on-ramps, and off-ramps do not fall under City jurisdiction.	1,869	16,998
Crashes did not occur on a "miscellaneous trafficway"	These crashes occurred on private roads and parking lots.	28	16,970
The final dataset contains 16,970 unique crashes.			

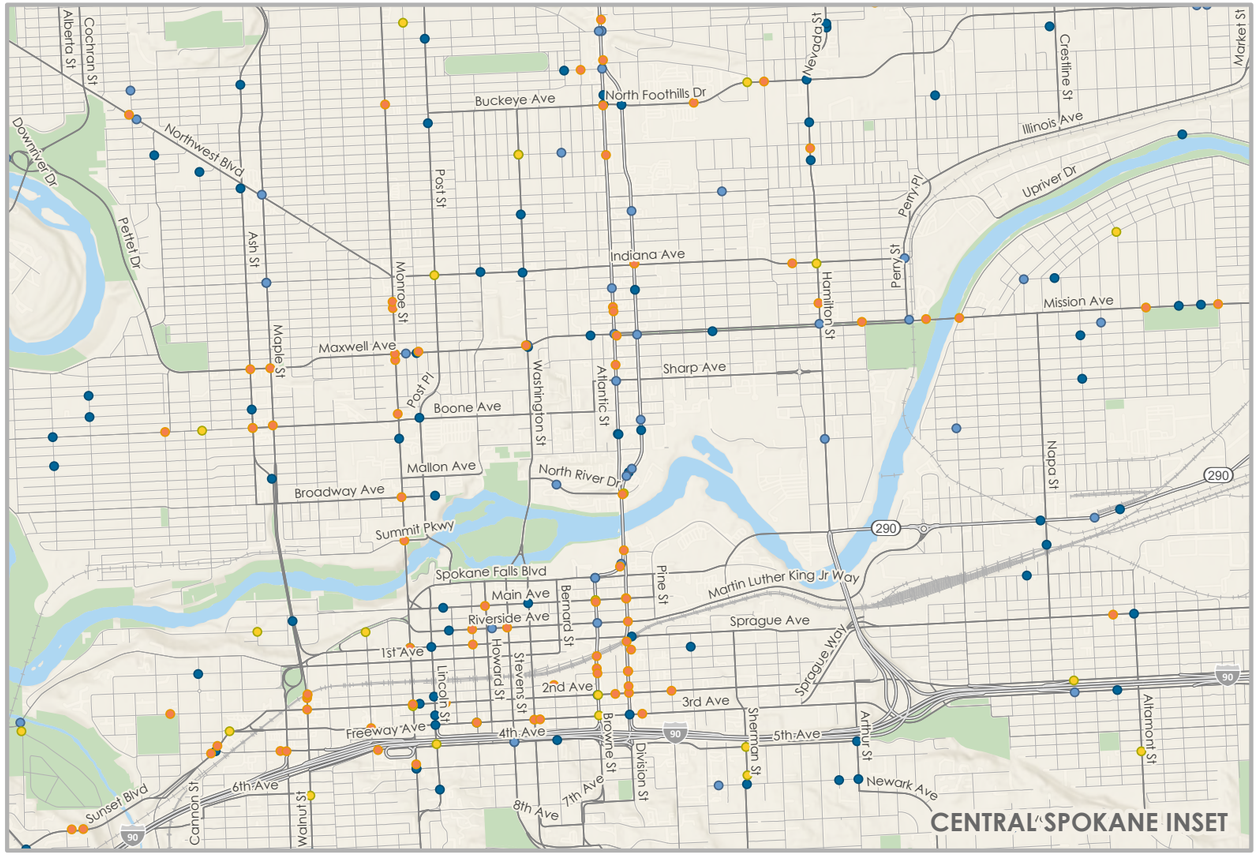
To support the systematic crash and roadway context analysis, key variables were cleaned further:

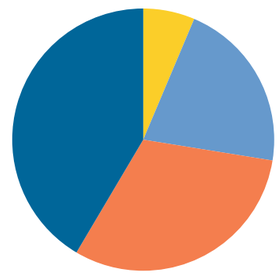
- **Crash Type:** Consolidated detailed first-collision and object-struck descriptions into a consistent set of crash types (e.g., rear-end, angle, run-off-road, fixed object).
- **Contributing Circumstances:** Standardized contributing circumstances by grouping similar factors into unified categories (e.g., distraction, inattention, failure to yield, impairment).
- **Human Error:** To build on the contributing circumstances analysis and better understand the reason why crashes are occurring a rule-based framework combining crash type, contributing factors, and contextual indicators was used to assign each crash a primary cognitive error type (e.g., Mistake, Lapse, Violation, and Slip). This creates a consistent and comparable human factors variable for analysis across the dataset. Using this human-error framework allows for analysis of repeatable errors by multiple roadway users at hotspot locations, to guide the selection of countermeasures and strategies to mitigate these errors.

Results

After the cleaning process, 16,970 crashes remained. These crashes were analyzed in a data visualizer Excel tool tailored to WSDOT data. The results of the data visualizer were confirmed against a previously developed tool by Kittelson used to assess WSDOT crash data, to verify data integrity. In addition, Kittelson's CrashKit software was used to identify the HIN. **Figure 2** shows the location of all the fatal and serious injury crashes as well as the study boundary.







Percent of FSI Crashes by Mode

Bicyclist 6% Motorcycle 21% Pedestrian 31% Only Vehicles 41%

Mode

- Pedestrian
- Bicyclist
- Motorcycle
- Only Vehicles

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Figure 2

Fatal and Serious Injury Crashes (FSIs) by Mode

Data Source: WSDOT Crash Data 2021-2025

Crash Summary

The total number of annual crashes has been on the decline, even prior to the change in reporting processes by WSDOT in 2025 (WSDOT stopped including citizen-reported crashes). However, with the exception of 2024, the number of fatal and serious injury (FSI) crashes has increased annually.

- From 2021 through 2025, there were 16,970 crashes.
- Of these crashes, 581 (3.4%) resulted in a fatal or serious injury.
- Although total crashes declined, FSI crashes increased, causing FSI crashes to represent a larger share of annual crashes—from 3.0% in 2021 to 4.1% in 2025.

Figure 3 illustrates the change in total and FSI crashes from 2021 to 2025. **Table 3** details the number of crashes by severity level and year.

Figure 3. Crash History by Year (2021 to 2025)

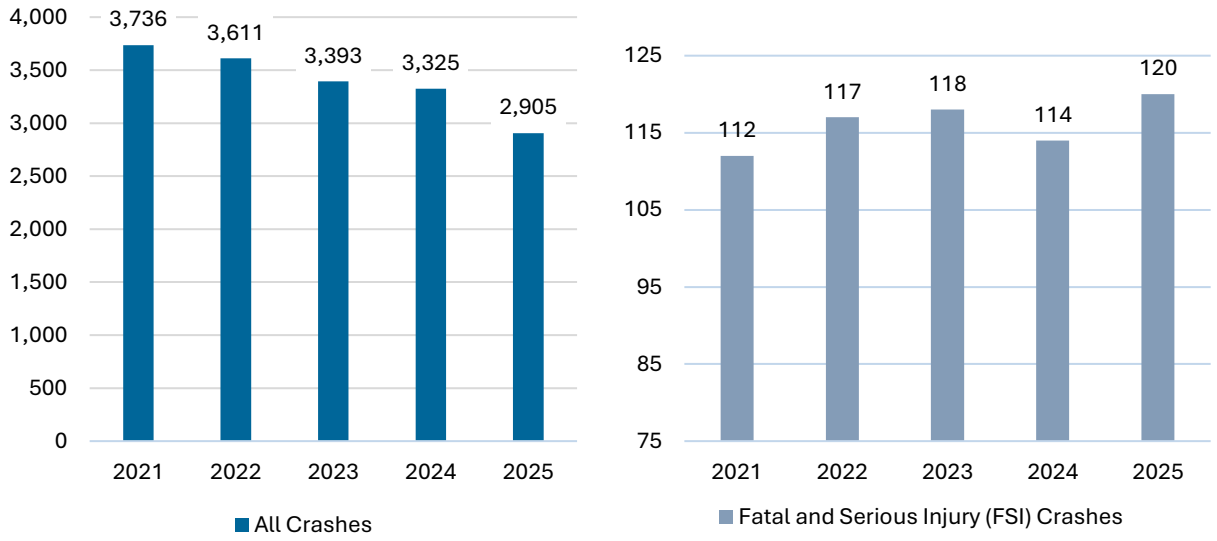


Table 3. Crash Severity by Year (2021 to 2025)

Crash Severity	2021	2022	2023	2024	2025[1]	Total
Fatal	26	14	18	18	22	98
Serious	86	103	100	96	98	483
Minor	506	470	524	496	425	2,421
Possible	760	738	660	640	619	3,417
No Injury	2,358	2,286	2,091	2,075	1,741	10,551
Total	**3,736**	**3,612**	**3,393**	**3,325**	**2,905**	**16,970**
Total Fatal and Serious Injury Crashes	112	117	118	114	120	581
% Fatal and Serious Injury Crashes	3.0%	3.2%	3.5%	3.4%	4.1%	3.4%

[1] WSDOT stopped including citizen-reported crashes in 2025. This corresponds with the large drop in the number of crashes resulting in No Injuries compared to previous years.

Crash Trends

This section summarizes the crashes by mode, crash type, environmental elements (e.g., lighting, weather), and neighborhood. These characteristics help to identify what actions and strategies can support mitigating and preventing severe crashes.

Modes

The analysis evaluated four crash mode categories: **vehicle-only**, **motorcyclist, bicyclist, and pedestrian**. The majority of crashes **(91.6%) were vehicle-only crashes**, which resulted in a fatal or serious injury 1.5% of the time. Crashes involving a motorcyclist, pedestrian, or bicyclist were much less frequent but were more likely to result in a fatal or serious injury.

- One in every four pedestrian crashes and one in every three motorcyclist crashes resulted in a fatal or serious injury.
- Pedestrian and motorcyclist crashes also had similar fatality rates, with 6.2% of both crash modes resulting in a fatality.

Figure 4 illustrates the distribution of crashes by mode. **Table 4** shows the number of crashes by severity level and mode

Figure 4. Crash Share by Mode (2021 to 2025)

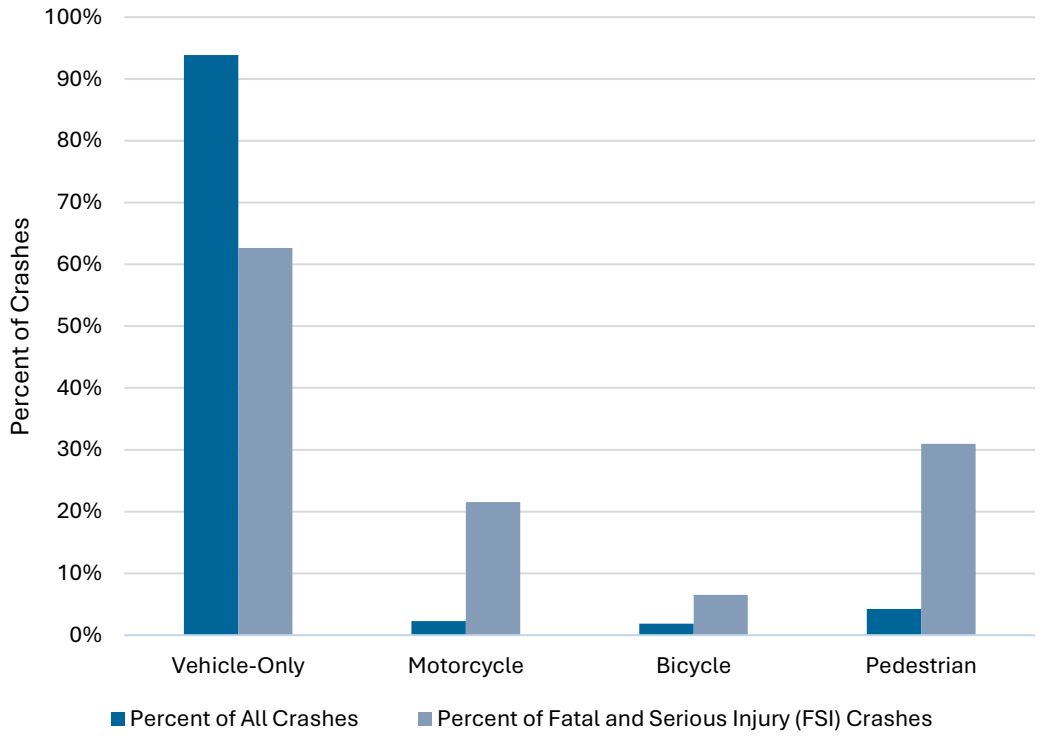


Table 4. Summary of Crash Mode and Severity Distribution (2021 to 2025)

Crash Severity	Bicycle	Pedestrian	Motorcycle	Vehicle-Only	Total
Fatal	2	45	24	29	98
Serious	36	135	101	212	483
Minor	188	357	132	1,745	2,421
Possible	66	172	70	3,109	3,417
No Injury	24	15	58	10,454	10,551
Total Crashes	**316**	**724**	**385**	**15,549**	**16,970**
Mode % of Total Crashes	1.9%	4.3%	2.3%	91.6%	100%
Total Fatal and Serious Injury Crashes	**38**	**180**	**125**	**241**	**581**
% of Mode Fatal and Serious Injury Crashes	12.0%	24.9%	32.5%	1.5%	3.4%
% of All Fatal and Serious Injury Crashes	6.5%	30.9%	21.5%	41.5%	100%

Total column values: *Two crashes involved both a pedestrian and a bicyclist, and two crashes involved both a pedestrian and a motorcyclist. These crashes are counted in both road user categories. The crashes are not double counted in the Total column, so the Total value does not equal the sum of the row.*

These results show that the most common crash mode is not necessarily the mode with the greatest risk of serious injury. Pedestrian and motorcyclist crashes made up a small share of total crashes, but they represented a much larger share of FSI crashes. Pedestrian crashes accounted for 180 FSI crashes, and motorcycle crashes accounted for 125 FSI crashes. Together, these two modes accounted for more than half of all FSI crashes in the dataset.

- **Vehicle Only** crashes account for 92% of the total crashes, **but 42% of the FSI crashes**.
- **Motorcycle** crashes account for only 2% of total crashes, **but 22% of FSI crashes**.
- **Pedestrian** crashes account for only 4% of total crashes**, but 31% of FSI crashes**.

Figure 5 illustrates the trend of total crashes for each mode over the 5-year period. **Vehicle-only** crashes and **motorcycle crashes** are trending **down**, while **pedestrian** involved crashes are **continuing to rise**. **Figure 6** illustrates trends for FSI crashes for each mode over the 5-year period.

Figure 5. Annual Crashes by Mode (2021 to 2025)

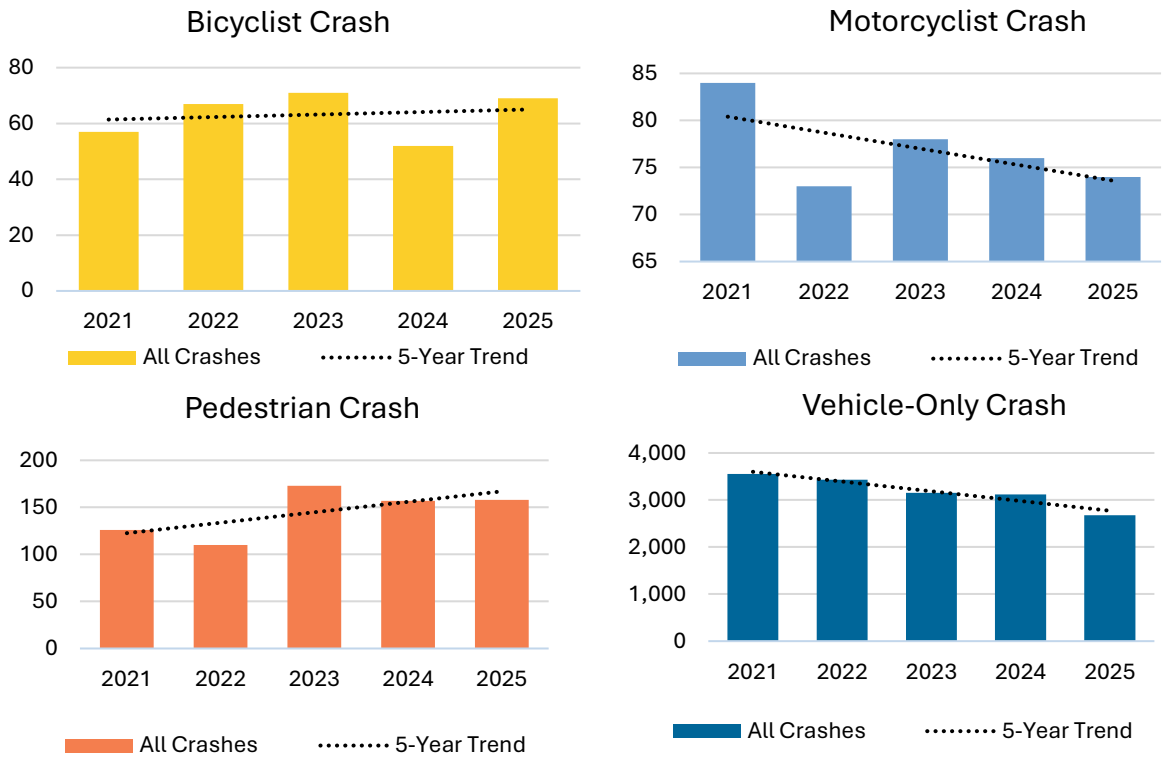
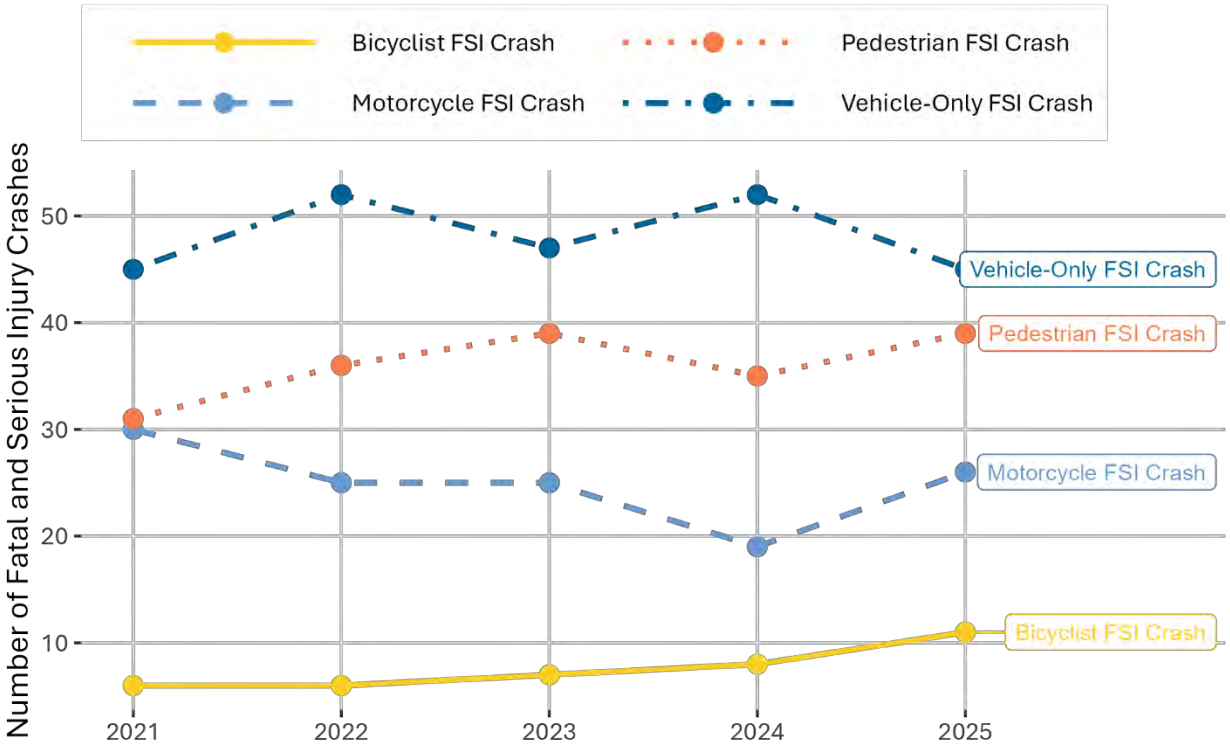


Figure 6. Annual Fatal and Serious Injury (FSI) Crashes by Mode (2021 to 2025)



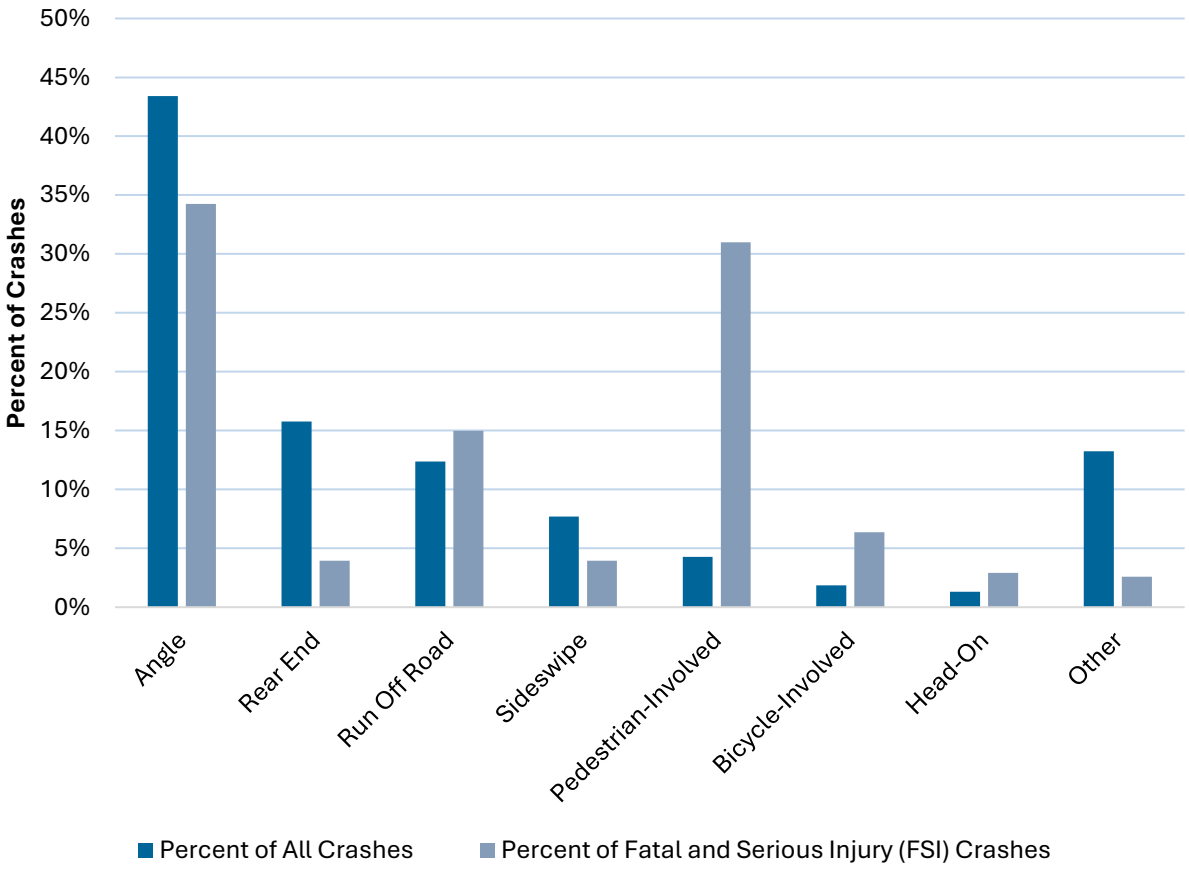
Collision Type

Figure 7 shows the distribution of crash type for all crashes and for FSI crashes, illustrating that the most common crash types are not always the most severe. For example, rear end crashes account for 16% of all crashes, but only account for 4% of FSI crashes.

Additionally, several crash types are overrepresented among fatal and serious crashes. This trend is observed for pedestrian crashes, bicyclist crashes, head-on crashes, and run off road crashes.

Run off road crashes, which comprise approximately 12% of all crashes and 15% of FSI crashes are typically a single-vehicle crash and involve the vehicle colliding with one or multiple roadside objects, such as a pole, tree, or curb.

Figure 7. Crash Type Distribution (2021 to 2025)



As vulnerable road user crashes are overrepresented in severe crashes, further data refinement was taken to better understand the type of crashes that involve these users. The most common user actions at the time of the crash is summarized in **Table 5**.

Table 5 Most Common Action for Vulnerable Road Users in Fatal and Serious Injury (FSI) Crashes (2021 - 2025)

Vulnerable Road User	Action		
	Most Common	2nd Most Common	3rd Most Common
Pedestrian	Crossing at non-intersection with no crosswalk (21%)	Crossing at intersection without signal (14%)	Crossing at intersection with signal (13%)
Bicyclist	Riding with traffic (53%)	Crossing or entering roadway (29%)	Riding against traffic (8%)
Motorcyclist	Angle crash (57%)	Run-off road (28%)	Sideswipe (6%)

Environmental Elements

Figure 8 illustrates the weather condition for FSI crashes by mode and **Table 6** shows the number of crashes by weather condition and severity. Most of the crashes happened in clear weather or partly cloudy weather (89%). 85% of FSI crashes occurred during these conditions.

The remaining crashes occurred in adverse weather conditions. The most common adverse weather condition was snow, followed by fog/smog/smoke. However, the only adverse condition with an FSI rate greater than that of clear weather was severe crosswinds, which had 10 crashes total, including 2 FSI crashes.

Figure 8. Distribution of Weather Conditions by Mode for Fatal and Serious Injury (FSI) Crashes (2021 to 2025)

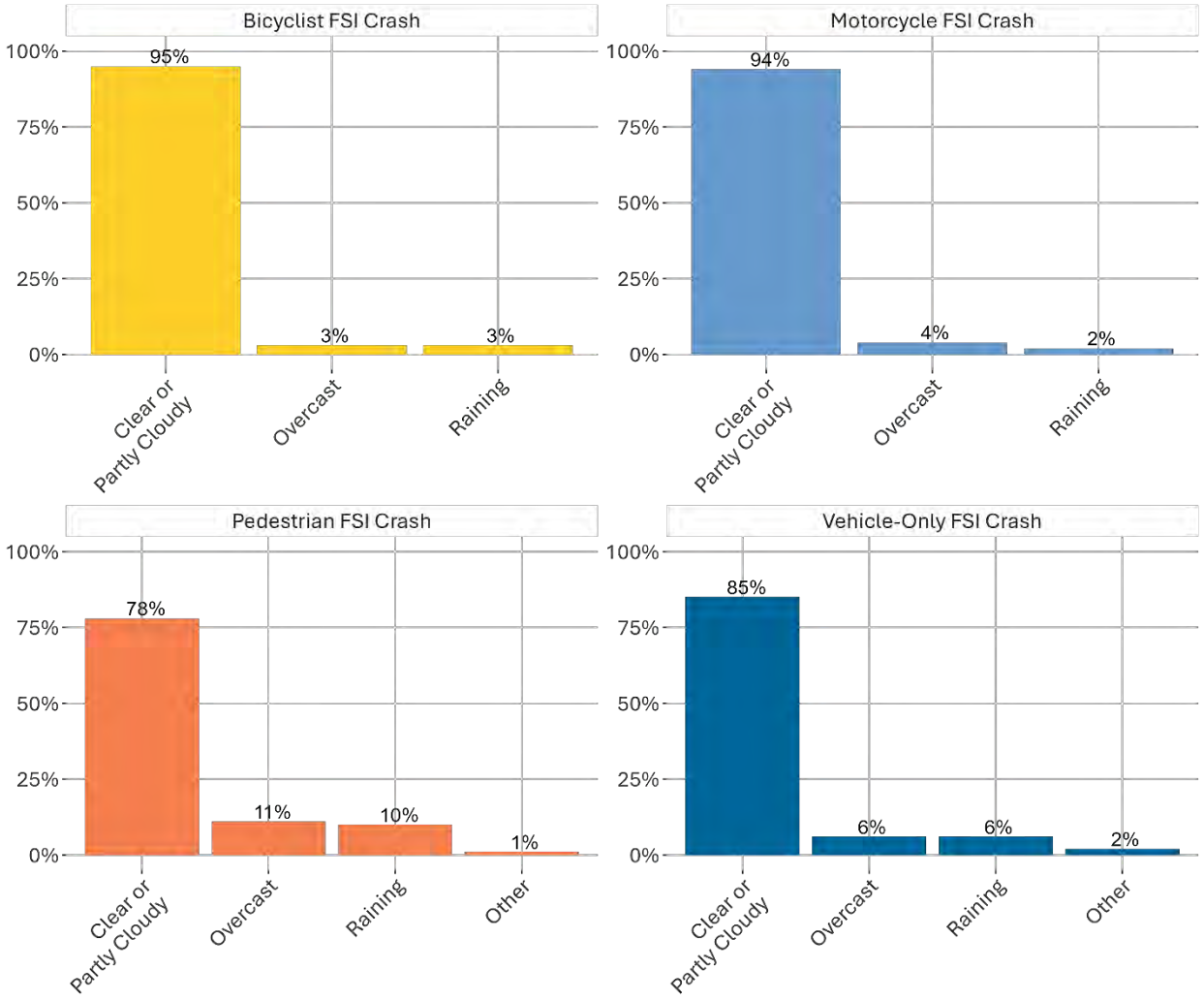


Table 6. Number of Crashes by Weather Condition and Severity (2021 to 2025)

Weather Condition	Fatal	Serious	Minor	Possible	No Injury	Total	FSI[1] Count	% of FSIs[1]
Clear or Partly Cloudy	74	424	1,978	2,702	7,787	**13,355**	**498**	**85.7%**
Overcast	14	27	226	355	1,075	**1,762**	**41**	**7.1%**
Raining	7	28	141	223	593	**1,034**	**35**	**6.0%**
Snowing	0	3	40	87	386	**538**	**3**	**0.5%**
Fog, Smog, or Smoke	0	1	29	34	97	**169**	**1**	**0.2%**
Sleet, Hail, or Freezing Rain	0	0	3	6	38	**48**	**0**	**0.0%**
Severe Crosswind	2	0	2	2	4	**10**	**2**	**0.3%**
Blowing Sand, Dirt, or Snow	0	0	0	1	2	**3**	**0**	**0.0%**
Other	0	0	2	7	29	**50**	**0**	**0.0%**
Total	**98**	**483**	**2,421**	**3,417**	**10,011**	**16,970**	**581**	**100%**

[1] FSI = Fatal and Serious Injury

Figure 9 illustrates lighting conditions by mode and **Table 7** details the number of crashes by lighting condition and severity. A greater share of pedestrian crashes occurred at night, with streetlights on compared to the other three modes analyzed.

Most of the crashes happened in daylight (65%). This trend is expected, as most driving occurs during the daytime. The lighting conditions present during fatal or serious injury crashes are as follows:

- Daylight crashes – 54.9% of FSIs
- Dark – Streetlights On – 35.5% of FSIs
- Dark – No Streetlights – 3.8% of FSIs
- Dark – Unknown Lighting - 2.6% of FSIs

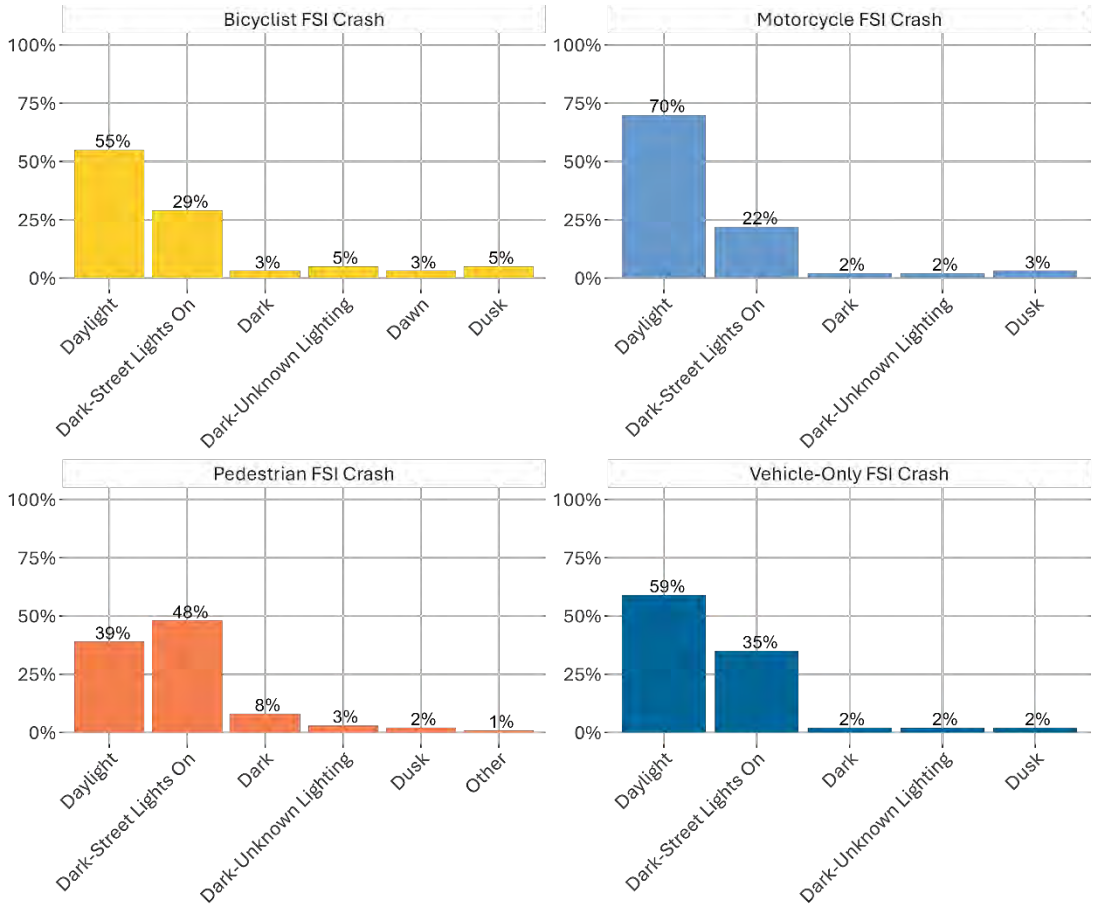
Pedestrian FSI crashes were the only mode category where crashes occurred more often in dark conditions with street lights on than in daylight: 48% occurred in dark conditions with streetlights on, compared with 39% in daylight.

Table 7. Number of Crashes by Lighting Condition and Severity (2021 to 2025)

Lighting Condition	Fatal	Serious	Minor	Possible	No Injury	Total	FSI[1] Count	% of FSIs[1]
Daylight	41	278	1,699	2,441	6,571	**11,030**	**319**	**54.9%**
Dark –Streetlights On	42	164	534	725	2,748	**4,213**	**206**	**35.5%**
Dusk	2	12	96	113	298	**521**	**14**	**2.4%**
Dark – No Streetlights	8	14	38	40	286	**386**	**22**	**3.8%**
Dark –Unknown Lighting	3	12	21	43	305	**384**	**15**	**2.6%**
Dawn	1	1	17	35	145	**199**	**2**	**0.3%**
Dark –Streetlights Off	0	2	10	12	47	**71**	**2**	**0.3%**
Unknown	1	0	6	8	151	**166**	**1**	**0.2%**
Total	**98**	**483**	**2,421**	**3,417**	**10,551**	**16,970**	**581**	**100%**

[1] FSI = Fatal and Serious Injury

Figure 9. Lighting Conditions by Mode for Fatal and Serious Injury (FSI) Crashes (2021 to 2025)



Where are crashes happening

Examining the distribution FSI crashes across neighborhoods can identify if any neighborhoods are overrepresented in the crash data. Each crash was mapped to the neighborhood where it occurred. Four FSI crashes had to be manually joined to a neighborhood due to not having a perfect overlap. This included one crash in Minnehaha, one in 5 Mile, and two in East Central.

The three neighborhoods with the **most FSI crashes** were:

- East Central - 57
- Nevada Heights - 53
- Riverside (Downtown) - 52

The highest number of **pedestrian-involved FSI crashes** were recorded in:

- Riverside (Downtown) - 27
- East Central - 17
- Nevada Heights - 17

The highest number of **bicyclist-involved FSI crashes** were recorded in

- East Central – 6
- Riverside (Downtown) – 5

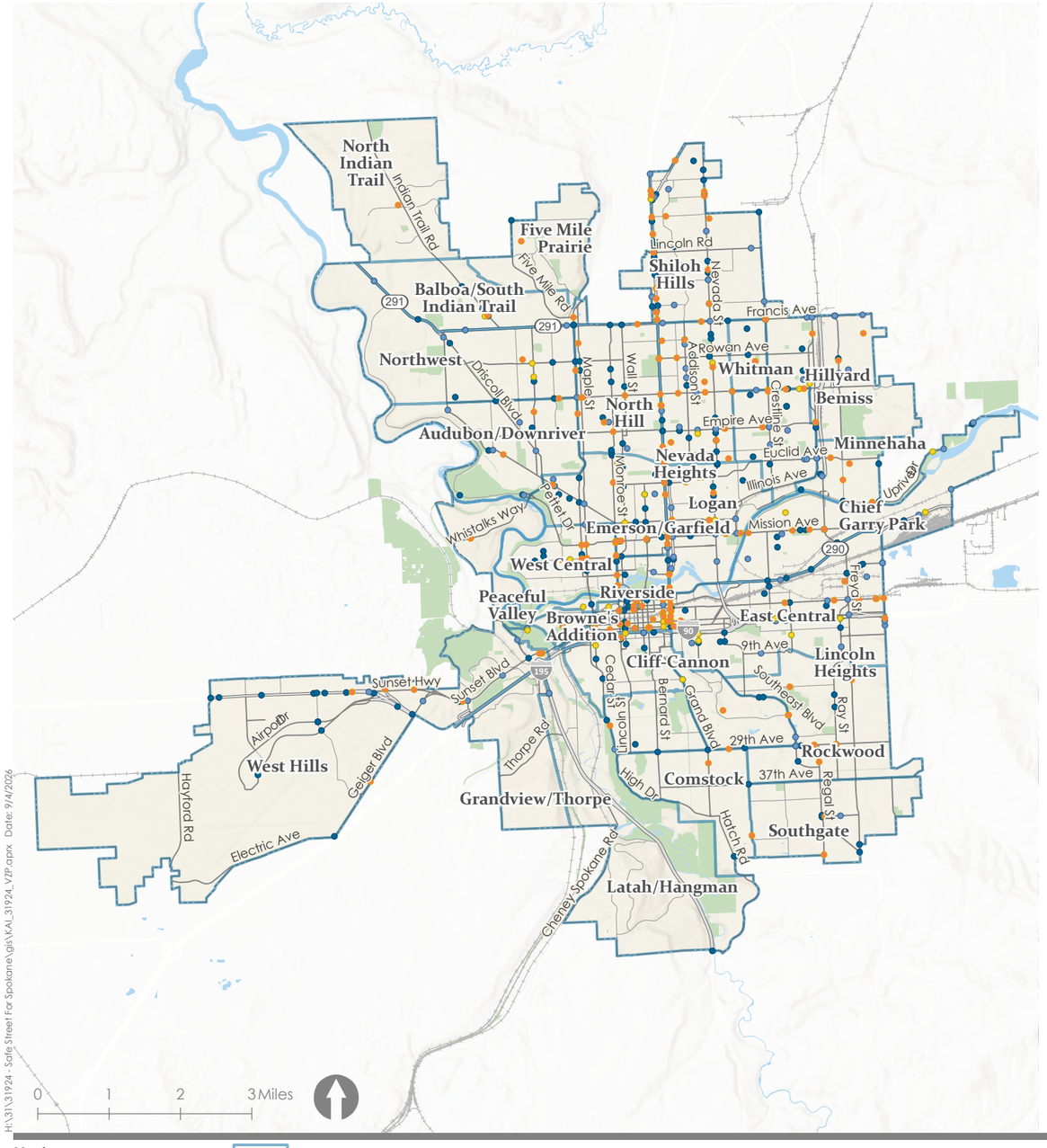
The highest number of **motorcyclist-involved FSI crashes** were recorded in:

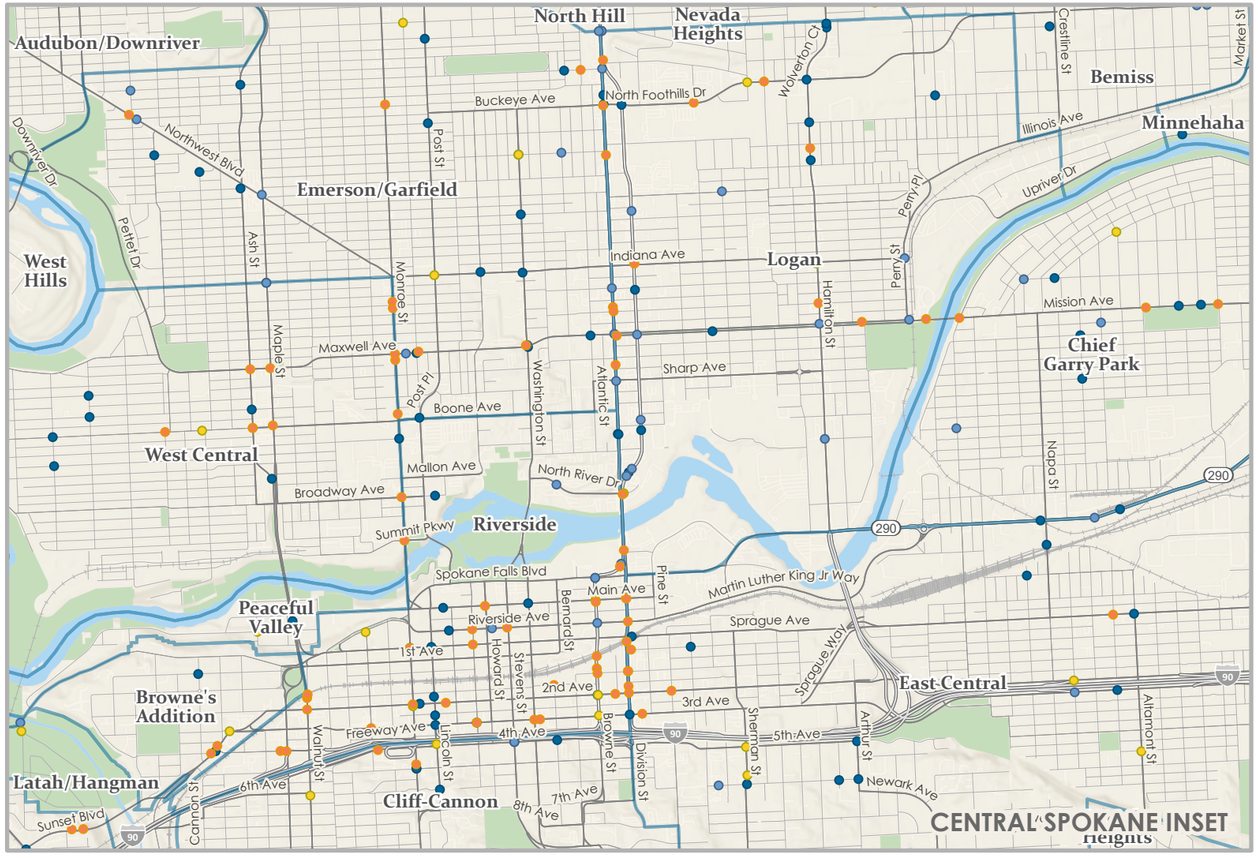
- East Central - 15
- Nevada Heights - 14
- Logan - 13

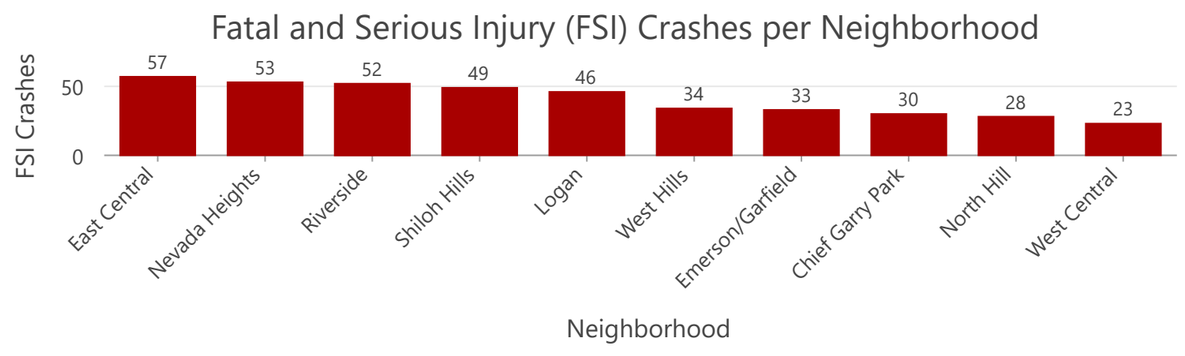
Table 8 presents the number of FSI crashes in each neighborhood. **Figure 9** illustrates the location of FSI crashes within them.

Table 8. Number of Fatal and Serious Injury (FSI) Crashes by Neighborhood (2021 to 2025)

Neighborhood	Vehicle Only	Motorcyclist	Pedestrian	Bicyclist	All Modes
East Central	34	15	17	6	57
Nevada Heights	34	14	17	2	53
Riverside (Downtown)	20	5	27	5	52
Shiloh Hills	31	11	16	2	49
Logan	27	13	16	3	46
West Hills	25	5	9	0	34
Emerson/Garfield	23	9	7	3	33
Chief Garry Park	23	7	4	3	30
North Hill	16	3	12	0	28
West Central	9	1	12	2	23
Hillyard	17	9	4	1	22
Bemiss	14	7	5	1	20
Northwest	14	5	2	2	18
Cliff-Cannon	10	1	2	3	15
Audubon/Downriver	11	5	3	0	14
Lincoln Heights	8	2	6	0	14
Minnehaha	10	2	4	1	14
Balboa/South Indian Trail	8	4	2	1	11
Southgate	5	1	2	0	7
Whitman	5	1	2	0	7
Browne's Addition	2	0	3	1	6
Comstock	3	0	3	0	6
Latah/Hangman	5	3	0	1	6
Rockwood	4	1	2	0	6
Manito/Cannon Hill	2	0	1	0	3
Five Mile Prairie	1	0	1	0	2
Grandview/Thorpe	2	1	0	0	2
Peaceful Valley	1	0	0	1	2
North Indian Trail	0	0	1	0	1
Total	**364**	**125**	**180**	**38**	**581**







Mode

- Pedestrian
- Bicyclist
- Motorcycle
- Only Vehicles

Neighborhoods

H:\31\31924 - Safe Street For Spokane\gis\KAI_31924_VZP.aprx Date: 9/4/2026

KITTELSON & ASSOCIATES

Figure 9

Fatal and Serious Injury Crashes (FSIs) by Neighborhood

Data Source: WSDOT Crash Data 2021-2025

Contributing Factors

Contributing factors are the conditions, behaviors, or circumstances that may have influenced the occurrence or severity of a crash. The data presented likely does not capture the full scale of the problem, as certain factors, such as distracted driving and drug impairment, cannot always be tested or observed by a responding police officer in the field.

- For example, over 24% of FSI crashes did not have a defined contributing circumstance, detailing a gap in the data. For example, it is unclear for speeding drivers whether they were speeding relative to the posted speed or to the flow of traffic.

Contributing Circumstances

Contributing circumstances refer to the main cause of the crash recorded by the officer who completed the crash report.

Drivers

The primary contributing circumstance for the **at-fault driver** for all FSI crashes was analyzed. **Table 9** and **Figure 10** detail the full results, below are key takeaways:

- **Failure to yield** was the most common factor in all crash types and 27% of FSI crashes.
- **A speeding driver** caused 13% of FSI crashes.
- **An impaired driver** caused over 20% of FSI crashes.
- **A distracted driver** caused over 20% of FSI crashes.

Frequency of Contributing Circumstances in Fatal and Serious Injury (FSI) Crashes (2021-2025)

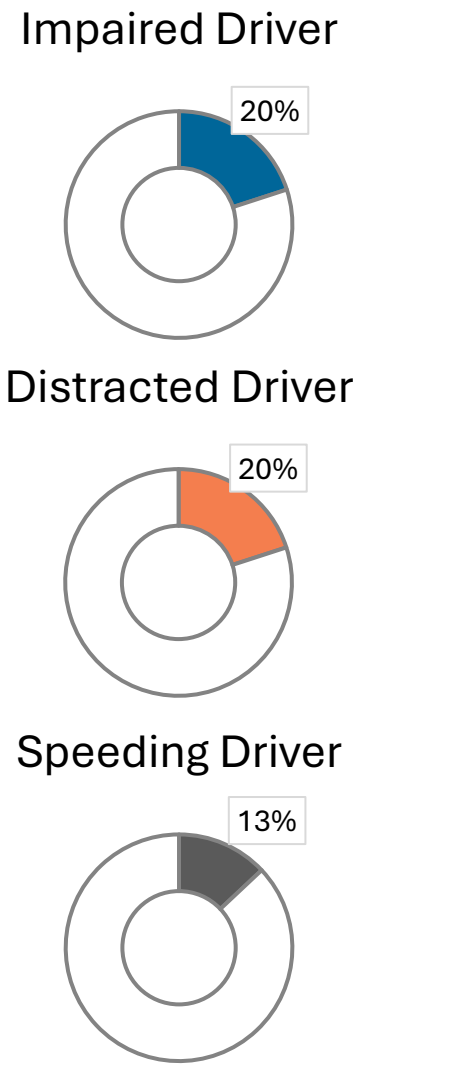
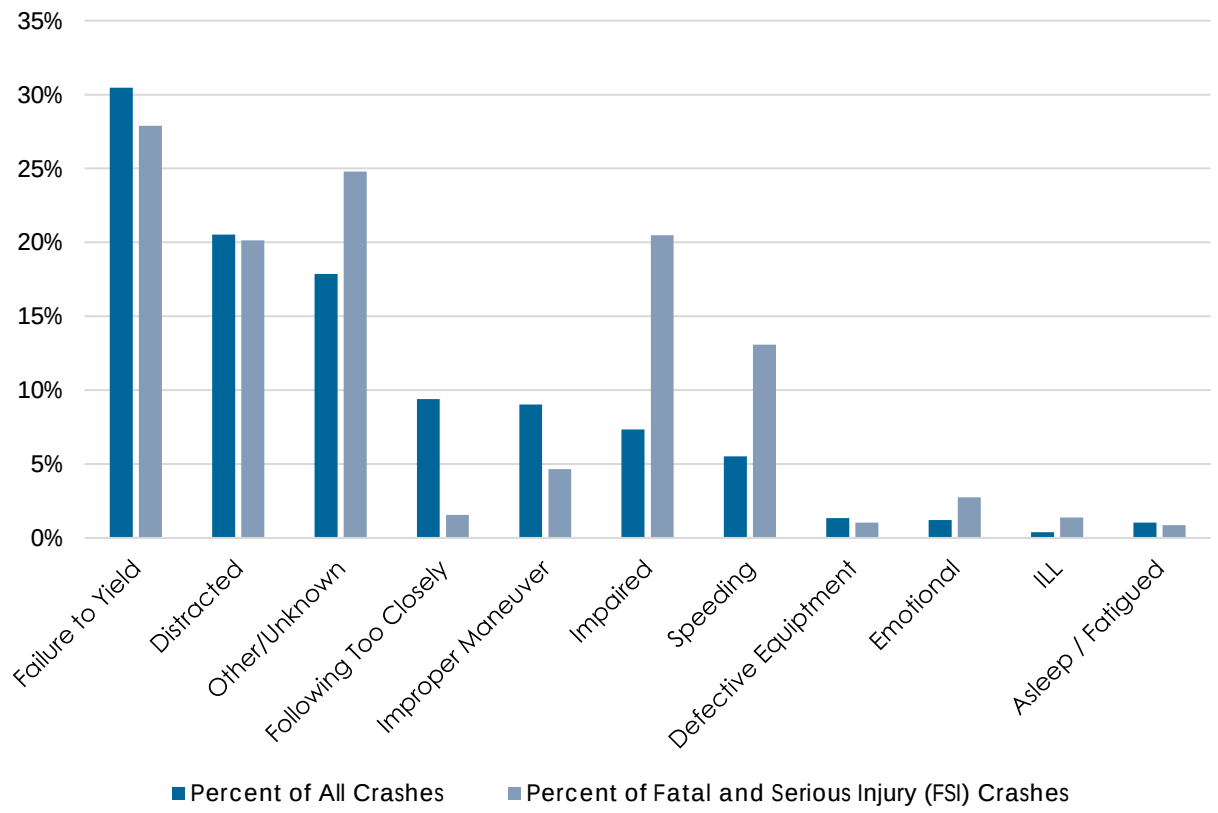


Table 9 Contributing Circumstances: At-Fault Driver (2021 - 2025)

Primary Crash Factor	Fatal	Serious	Minor	Possible	No Injury	Total[1] Crashes	FSI[2] Crashes	Percent of FSIs[3]
Failure to Yield	12	145	874	1383	2,605	**5,019**	**157**	**27%**
Distracted	22	95	450	563	2,353	**3,483**	**117**	**20%**
Other/Unknown	26	117	464	469	2,107	**3,183**	**143**	**25%**
Following Too Closely	1	8	186	425	943	**1,563**	**9**	**2%**
Improper Maneuver	2	23	146	172	1,139	**1,482**	**25**	**4%**
Impaired	47	72	205	221	701	**1,246**	**119**	**20%**
Speeding	20	56	132	153	577	**938**	**76**	**13%**
Defective Equipment	0	6	30	40	138	**214**	**6**	**1%**
Emotional	3	11	27	27	124	**192**	**14**	**2%**
Fatigued	0	5	30	46	94	**175**	**5**	**1%**
Ill	3	4	11	19	26	**63**	**7**	**1%**

[1] Contributing-circumstance crash counts do not sum to total crashes because a single crash may be flagged under multiple factors, such as impaired driving and speeding.
[2] FSI = Fatal and Serious Injury

Figure 10 Distribution Contributing Circumstances: At-Fault Driver (2021 – 2025)



Vulnerable Road Users

Contributing circumstances to FSI crashes for vulnerable road users, pedestrians, cyclists, and motorcyclists, were analyzed for trends that may differ from the overall dataset. **Table 10** details the most common actions by these users resulting in a fatal or serious injury.

Table 10 Common Factors Present in Vulnerable Road Users Fatal and Serious Injury (FSI) Crash (2021 - 2025)

Vulnerable Road User FSI	Factors Attributed to Vulnerable Road User		
	Most Common	2nd Most Common	3rd Most Common
Pedestrian	22% did not grant ROW to vehicle (40 FSI crashes)	10% unknown distraction (18 FSI crashes)	9% under influence of alcohol (16 FSI crashes)
Bicyclist	7% did not grant ROW to vehicle (7 FSI crashes)	13% disregarded traffic sign and signals (5 FSI crashes)	8% followed too closely (3 FSI crashes)
Motorcycle	22% did not grant ROW to vehicle (28 FSI crashes)	12% exceeding stated speed (5 FSI crashes)	11% unknown distraction (14 FSI crashes)

*Crash factors are often under reported for pedestrians and cyclists involved in crashes. An "Unknown" contributing circumstance makes up the largest % of FSI crashes for both **pedestrians (29%) and bicyclists (39%).**

Distraction, speeding and impairment were also analyzed for the vulnerable road user FSI crashes (**Table 11**):

- 28% of FSI pedestrian crashes involved a **distracted driver.**
- 9% of FSI pedestrian crashes involved an **impaired pedestrian.**
- 23% of FSI **motorcycle crashes** involved a speeding rider.

Table 11 Contributing Circumstances to Vulnerable Road User Fatal and Serious Injury (FSI) Crashes (2021 – 2025)

Vulnerable Road User FSI	Distracted Driver	Speeding Driver	Impaired Driver	Impaired VRU
Pedestrian	28% (50 drivers)	1% (2 drivers)	6% (11 drivers)	9% (16 Pedestrians)
Bicyclist	18% (3 drivers)	0%	3% (3 drivers)	5% (2 Bicyclists)
Motorcyclist	13% (16 drivers)	23% (29 drivers)	7% (9 drivers)	9% (11 Motorcyclists)

Type of Errors

Human Factors is the study of how people see, understand, and react to road conditions. In roadway safety, it helps explain why people make mistakes—not just where crashes happen. NCHRP Report 600, *Human Factors Guidelines for Road Systems*, shows how roadway design, traffic control, visibility, driver expectations, and workload can affect safety. Using this approach, the crash analysis looked beyond crash locations and patterns to better understand why people made certain decisions or errors. This supports the Safe System principle that people make mistakes and roadway design and user education can help prevent common errors, such as missed information or poor judgment. Rather than simply labeling crashes as "driver error," the analysis grouped crashes into clear error types linked to roadway context and human behavior. [1] These distinct types are described below in Table 12:

Table 12 Human Factor Error Categories

Category	Explanation	Example Crash scenario
Slip	The driver tried to do the right thing but was unsuccessful.	Attempting to stop in time for a pedestrian in a crosswalk but not engaging the brakes soon enough.
Lapse	The driver didn't notice something important.	Turning without seeing an approaching car blocked by a larger vehicle.
Mistake	The driver responded to the situation but made the wrong choice.	Failing to yield to traffic at a 4-way stop after allowing a pedestrian to cross.
Violation	The driver knowingly chose to do something unsafe, despite knowing the law.	Street racing.
Mechanical Failure	The vehicle physically broke or a system failed.	A flat tire causing a driver to lose control.
Unknown	The report did not contain enough information to draw an accurate conclusion.	

Error Type: Methodology

Errors were classified according to the information provided in WSDOT crash data set:

- **Sequence:** A detailed list of actions for each vehicle involved (e.g., ran off the road to the right, proceeded after stopping for a stop sign).
- **Mechanical Defects:** Vehicular mechanical problems (e.g., brake failure, tire failure).
- **Environment Variables:** Environment and roadway geometry (e.g., lighting, weather, road surface, curve, hill.)
- **Action:** Explicit driver actions at the moment of the crash (e.g., going straight, turning, changing lanes).

[1] Rasmussen, Jens. *Human Errors: A Taxonomy for Describing Human Malfunction in Industrial Installations*. and, Reason, James. "Human error: models and management." *BMJ* 320 (2000): 768–770.

Each crash was assigned an error type using a decision tree based using these steps:

- First, was the error deliberate?
  - Driver impairment and reckless driving automatically flag the crash as a **Violation.**
- Second, were any mechanical defects present before the crash?
  - Factors such as brake failure and tire blowouts automatically flagged a crash as a Mechanical failure.
- Third, crashes were grouped as slip, lapse, mistake, or unknown based on the driver action and contributing circumstances listed in the crash record.
  - Driver actions were reviewed first. If the action clearly matched an error type, it was assigned to that group. For example, “foot slipped off clutch or brake” was assigned as a slip error.
  - Contributing circumstances were reviewed next. If a circumstance clearly matched an error type, it was assigned to that group. For example, improper passing was assigned as a mistake error.
  - If the error type was not clear from one field, the crash was reviewed using a combination of information, such as crash type, traffic control, and contributing circumstances.
- If there was not enough information to confidently assign an error type, the crash was labeled as unknown.

Table 13 details the three highest error types for fatal and serious injury (FSI) crashes.

- Slips, mistakes and violations proportionally led to more severe crashes.
- Violations led to a greater rate of FSI crashes.

Table 13. Number of Crashes by Type of Error and Severity (2021 to 2025)

Human Error	Fatal	Serious	Minor	Possible	No Injury	All Crashes	% of All Crashes	FSI Crashes	% of FSI
Mistake	10	143	1,033	1,676	4,147	**7,009**	**41%**	**153**	**26%**
Slip	26	157	802	1,134	4,519	**6,638**	**39%**	**183**	**31%**
Violation	52	101	274	295	295	**1,017**	**6%**	**153**	**26%**
Mechanical Failure	0	4	26	37	148	**215**	**1%**	**4**	**1%**

These results help to inform the selection of countermeasures to reduce FSI crashes. For example, countermeasures that simplify decision making, such as replacing a permissive left-turn signal head, with a flashing yellow arrow signal head, may mitigate mistake errors at signalized intersections with a high number of crashes.

Systemic Roadway Context Assessment

The systemic roadway context assessment identify locations that may be at a higher risk for FSI crashes in the future even if significant crash history is not present today. The characteristics included in the analysis are:

- Roadway functional classification
- Number of lanes
- Posted and Operating Speed
- Land use

Systemic safety improvements are most effective when applied to roadway types that account for a higher share of crashes than their share of centerline miles in the network. For example, if a focus area prioritizes funding for 10 percent of the network where 30 percent of crashes occur, projects implemented on those facilities are expected to have a greater effect on reducing future crashes. A "risk factor" is calculated to identify and prioritize these locations. The risk factor compares two values:

- **Portion of FSI Crashes:** What percentage of FSI crashes occur on roadways with a given set of characteristics?
- **Portion of Centerline Miles:** What percentage of centerline miles occur on roadways with a given set of characteristics?

The risk factor is calculated as the Portion of FSI Crashes divided by the Portion of Centerline Miles. Based on the systematic analysis, the following network characteristics result in the highest risk factors:

- Principal Arterials with 3+ lanes
- Roadways in Commercial or Mixed-Use Areas
- Roadways where the operating speed exceeds the posted speed limit of 35 MPH

Functional Classification

The share of FSI crashes by functional classification is compared with the share of centerline miles **Table 14**. The classifications analyzed are consistent with the typical functional classification hierarchy. Each crash was spatially joined to the roadway's functional classification. For crashes that occurred at intersections, the higher roadway classification was assigned. For example, a crash at the intersection of a collector and a minor arterial was reported as occurring on a minor arterial.

Principal arterials, minor arterials and highways have the highest risk for severe crashes along the City's network. For example, 30% of FSI crashes occurred on principal arterials, but only 7% of the roadway network is classified as a principal arterial.

Functional classification was further analyzed based on two land use contexts:

- **Mixed Use / Commercial:** Highways have the greatest risk factor, but Principal Arterials have a greater portion of fatal and serious injury crashes
- **Residential:** Principal Arterials have the greatest risk factor, but nearly 50% of the residential fatal and serious injury crashes occur on local streets.

Table 14. Portion of Crashes and Roadway Network by Functional Classification

Functional Classification	Portion of Fatal and Serious Injury Crashes	Portion of Centerline Miles	Risk Factor
Local	27%	60%	0.45
Collector	8%	6%	1.47
Minor Arterial	17%	7%	2.32
Principal Arterial	30%	7%	4.28
Highway*	17%	3%	6.43
*I-90 and ramps are excluded.			

Number of Lanes

The portion of FSI crashes on roadways by number of lanes is compared to the centerline miles of each lane configuration in **Table 15**.

- Roadways with 5+ lanes and 3 or 4 lanes have the highest risk for severe crashes.
  - For example, 6% of FSI crashes have occurred on roads with 5 or more lanes but only 0.8% of the roadway network has more than 5 lanes.

Table 15. Fatal and Serious Injury Crashes by Number of Lanes

Number of Lanes	Portion of Fatal and Serious Injury Crashes	Portion of Centerline Miles	Risk Factor
1* & 2	50%	90%	0.57
3 & 4	43%	9%	4.91
5+	6%	0.8%	7.52

*A one lane road is a roadway without 2 distinctly marked lanes, or a single marked lane.
Source for Number of Lanes: Open Streets 2025

Posted and Operating Speeds

Posted speeds and operating speed data was used to examine the speed context of roadways experiencing higher crash rates. As shown in **Table 16**, roadways posted at 30 MPH or higher carry a disproportionate share of fatal and serious injury (FSI) crashes.

- For example, roads posted at 30 MPH account for 48% of FSI crashes but only 14% of centerline miles.

Table 16. Fatal and Serious Injury Crashes by Posted Speed

Posted Speed	Portion of Fatal and Serious Injury Crashes	Portion of Centerline Miles	Risk Factor
Less than 30	33%	79%	0.42
30	48%	14%	3.39
35	11%	3%	3.74
40	2%	0.3%	5.02
45	4%	1%	3.99
50+	3%	3%	1.05

Source for Number of Lanes: Open Streets 2025

Posted speed does not fully capture the speed environment because people often drive faster or slower than the posted limit. To account for this, 85th percentile operating speeds from 2025 Replica data were compared with 2025 FSI crashes, as shown in **Table 17**.

- The results indicate that roadways operating between 35 and 40 MPH have an elevated share of FSI crashes.

Table 17. 2025 Fatal and Serious Injury Crashes by 85th Percentile Operating Speed

85% Operating Speed	Portion of Fatal and Serious Injury Crashes	Portion of Centerline Miles	Risk Factor
Less than 25	9%	46%	0.20
25	15%	9%	1.74
30	23%	14%	1.61
35	35%	18%	1.90
40	14%	4%	3.17
45	0%	1%	0.00
50+	3%	4%	0.76
Speed Data Source: 2025 Replica			

Land Use

Land use provides additional context for where severe crashes occur. As shown in **Table 18**, FSI crashes are overrepresented on roadways in commercial and mixed-use areas compared with those areas' share of the roadway network.

- For example, mixed-use areas account for 18% of FSI crashes but only 6% of centerline miles.

Table 18. Serious and Fatal Injury Crashes by Land Use (City of Spokane 2024 Existing Land Use Plan)

Land Use	Portion of Fatal and Serious Injury Crashes	Portion of Centerline Miles	Risk Factor
Mixed Use	18%	6%	3.16
Commercial	33%	12%	2.86
Institutional	1%	2%	0.86
Residential	36%	70%	0.52
Industrial	8%	7%	1.12
Open Space / Agricultural	3%	4%	0.87

Source: City of Spokane 2024 Existing Land Use Plan

Because land use influences how people travel and interact with the roadway, the analysis also evaluated how crash risk varies by roadway characteristics within mixed-use/commercial and residential contexts. The findings show that risk is not tied to land use alone; it is highest where higher-intensity land uses overlap with higher-order facilities, wider roadways, and higher-speed conditions.

- Roadways In Mixed Use / Commercial Land Use Types:
  - Highways have the greatest risk factor, but Principal Arterials have a greater portion of fatal and serious injury (FSI) crashes, accounting for 31% of FSI crashes.
  - Roadways with 5 or more lanes have the greatest risk factor but 3 or 4 lanes have a greater portion of fatal and serious injury (FSI) crashes, accounting for 60% of FSI crashes.
  - Roadways posted at 45 MPH have the highest risk factor even though they only make up 2% of the network, they account for 5% of fatal and serious injury crashes.

- Roadways In Residential Land Use Types:
  - Principal Arterials have the greatest risk factor but nearly 50% of the fatal and serious injury crashes occur on local streets.
  - Roadways with 3 or more lanes have the greatest risk factor. They account for- 20% of FSI crashes but only 3% of the roadway network.
  - Roadways posted at 45 MPH also have the highest risk factor. They make up less than 0.2% of the network and account for 3% of FSI crashes.

High Injury Network (HIN) Analysis

A crash screening analysis was used to develop the High Injury Network (HIN) which identifies the corridors and intersections with the highest frequency of crashes, emphasizing fatal and serious injury crashes.

HIN Screening Methods

The HINs were developed using a screening analysis based on an annual equivalent property damage only (EPDO) severity score. This score weights crash history by severity to identify corridors and intersections with more severe crash outcomes. Severity scores were calculated the following:

- **Corridors:** This evaluation includes all crashes and all modes including intersection crashes. This process identifies multiple intersections in a row that collectively have a high crash history and may not otherwise be identified in the intersection evaluation due to low independent crash histories.
- **Intersection Only:** This evaluation includes all crashes and all modes within a 250-foot radius of an intersection. Where intersections were less than 500 feet from each other, crashes were assigned to the nearest intersection.
- **Pedestrian and Bicyclist Corridors:** This evaluation created dedicated HINs for pedestrians and for cyclists.

Corridor HIN

The following steps were taken to develop the corridor HIN.

- **Conduct a Sliding Window Analysis:** The initial corridor HIN was developed using a sliding window analysis, which aggregates crash history along a roadway by moving a predetermined-length "window" through the street network at defined intervals, or "slides." For this analysis, the team used a half-mile window with a quarter-mile slide.
- **Snap Crashes to Network**: Crashes were assigned to each sliding window segment. The linear referencing system for the sliding window network was then used to count crashes by severity level within each segment.

- **Calculate Initial Severity Score:** For each sliding window segment, the severity score was calculated by multiplying the number of crashes at each severity level by the corresponding severity weight. The resulting weighted values were summed to calculate the **annual severity score** for that segment. The severity weights were derived from WSDOT's financial cost of a crash:
  - Fatal and serious injury crashes: 239 points each
  - Minor injury crashes: 17 points
  - Possible injury crashes: 10 points
  - No injury crashes: 1 point
- **Develop HIN Corridors:** The highest scoring segments that included 50% of the FSI crashes were aggregated into HIN corridors. This was done to create logical corridor extents.
- **Calculate Final Severity Score:** A severity score was calculated for each HIN corridor based on the average severity per mile. Scores were weighted by corridor length to account for differences in corridor length. This per-mile severity score prioritizes corridors with higher concentrations of severe outcomes, rather than simply identifying longer corridors with more conflict points. The analysis resulted in corridors being grouped into two groups:
  - **Primary HIN** The highest scoring corridors. Corridors are added to this group, until the total count of FSIs for the group reaches 25% of the total FSI crashes within the City.
  - **Secondary HIN** The highest scoring corridors. Corridors are added to this group, until the total count of FSIs for the group reaches 50% of the total FSI crashes within the City.

Intersection HIN

The following steps were taken to develop the intersection HIN.

- **Define Intersections:** Intersections points were generated using the latest OpenStreetMap's (OSM) data and reviewed for accuracy.
- **Snap Crashes to Network:** Crashes were joined to the nearest intersection with a 250-foot radius.
- **Calculate Severity Score**: Severity scores were calculated using the same formula as the corridor HIN but were not standardized per mile.
- **Develop HIN**: Based on severity score, a list of intersections for the HIN was identified and include 25% of intersection FSI crashes.

Pedestrian and Bicyclist HINs

The same methodology used to create the Corridor HIN was used to develop pedestrian and bicyclist specific HINs with three key differences:

- **Crash Filter:** Only crashes coded as pedestrian- or bicyclist involved were used to develop the respective mode HINs.

- **Crash Severity Weights.** Different weights used to calculate the EPD score because pedestrians and cyclists are more sensitive to severity than vehicle-only crashes. The difference between minor and serious injury can be much smaller for pedestrians and bicyclists, as shown in pedestrian injury risk curves, including recent work by the Insurance Institute for Highway Safety (Monfort and Mueller, 2025). These curves show injury risk increasing sharply with impact speed because pedestrians and bicyclists lack the protection of an occupant compartment.
  - Fatal and serious injury crashes: 100 points each
  - Minor and possible injury crashes: 100 points each
  - No injury (PDO) crashes: 1 point each
- **Develop HINs.** The results identify the corridor segments with the highest severity scores that collectively account for 50 percent of all fatal or serious injury crashes involving pedestrians or bicyclists. This higher threshold was used because pedestrian and bicyclist fatal or serious injury crashes occur less frequently overall, allowing the analysis to capture relevant crash patterns beyond the City's urban core.
  - Severity scores for these corridors are generally lower than the full HIN, as there are far fewer pedestrian and bicyclist crashes overall. The length of the corridor has a greater impact on the severity scores due to the smaller sample size. Shorter corridors with more concentrated crash history score higher, even with less severe outcomes. This ranking accounts for pedestrian and bicyclist risk curves, or the difference between a minor and serious injury being smaller for vulnerable users.

HIN Key Findings

SEVERE CRASHES ARE CONCENTRATED ON A SMALL PORTION OF THE NETWORK

The High Injury Network identifies corridors and intersections that account for a disproportionately high share of crashes with the most severe outcomes.

THE CORRIDOR HIN INCLUDES ALL MODES AND ENCOMPASSES ROADWAYS WHERE 50% OF FSIS OCCURRED. THESE ROADWAYS COVER 5.5% OF THE CITY'S NETWORK, OR 58 TOTAL CENTERLINE MILES.

Table 19 identifies the highest scoring corridors based on all modes. Collectively, they account for 50% of the fatal and serious injury (FSI) crashes. Corridors in **bold** account for 25% of FSI crashes. The table also shows where the Corridor HIN overlaps with Pedestrian and Bicyclist only HINs. **Figure 11** illustrates these corridors and the intersection HIN.

Table 19. Corridor HIN Results (All Modes)

	Street Name	From	To	All Crashes	FSI[1] Crashes	Length (miles)	Severity Score	Bike HIN	Ped HIN
1	**Browne St**	Spokane Falls Blvd	7th Ave	218	6	0.7	**690**	●	●
2	**Lincoln St**	4th Ave	Spokane Falls Blvd	87	5	0.5	**661**	●	
3	**Walnut St**	Riverside Ave	7th Ave	62	5	0.5	**614**		●
4	**Division St**	Cleveland Ave	Spokane Falls Blvd	338	14	1.7	**583**		●
5	**Ruby St**	North River Dr	Cleveland Ave	295	10	1.5	**551**		●
6	**Riverside Ave**	Monroe St	Division St	104	6	0.7	**538**		
7	**2nd Ave**	Sunset Blvd	Division St	283	6	1.2	**529**	●	●
8	**Sunset Hwy**	Airport Dr	Rustle Rd	28	5	0.5	**504**		
9	**North Foothills Dr**	Division St	Hamilton St	116	4	0.7	**489**	●	
10	**Nevada St**	Longfellow Ave	Hamilton St	96	8	1.0	**465**	●	●
11	**Newport Hwy**	Division St	Westview Ave	80	3	0.5	**440**		
12	**Francis Ave**	Walnut St	Alberta St	92	4	0.7	**428**	●	
13	**Nevada St**	Westview Ct	Central Ave	272	14	2.4	**414**	●	●
14	**Division St**	Westview Ave	Cleveland Ave	565	23	4.2	**413**		●
15	**Freya Way**	Misson St	Freya St	22	3	0.4	**410**		
16	**Division St**	8th Ave	North River Drive	126	7	1.1	**408**		●
17	**Hartson Ave**	Chandler St	Arthur St	14	4	0.5	**402**		
18	**Main Ave**	Monroe St	Pine St	67	6	0.8	**400**	●	●
19	**29th Ave**	Martin St	Rebecca St	135	6	1.1	**390**		●
20	**Empire Ave**	Market St	Division St	215	13	2.2	**389**		
21	**Mission Ave**	Washington St	Rebecca St	346	15	2.9	**388**	●	●
22	Boone Ave	Chestnut St	Monroe St	104	4	0.8	**384**	●	●

	Street Name	From	To	All Crashes	FSI[1] Crashes	Length (miles)	Severity Score	Bike HIN	Ped HIN
23	3rd Ave	Walnut St	Spokane St	152	7	1.3	**380**	●	●
24	Sunset Blvd	2nd Ave	Hemlock St	52	3	0.5	**372**	●	●
25	Euclid Ave	Cook Street	Freya St	95	4	0.8	**371**	●	
26	Monroe St	Walton Ave	Mallon Ave	249	10	2.0	**369**	●	●
27	Upriver Dr	Rebecca St	Havana St	4	3	0.4	**366**		
28	Havana St	Harston Ave	Sprague Ave	64	2	0.5	**360**		●
29	Indiana Ave	Standard St	Perry St	49	3	0.5	**357**		
30	Monroe St	Spokane Falls Blvd	9th Ave	106	4	0.8	**354**	●	●
31	Sprague Ave	Magnolia St	Havana St	160	8	1.7	**347**	●	●
32	Sprague Ave	Grant St	Cedar St	197	5	1.3	**345**	●	●
33	Hamilton St	Foothills Dr	Cataldo Ave	150	5	1.2	**338**		●
34	Indiana Ave	Madison St	Washington St	75	2	0.5	**336**		
35	Maxwell Ave	Belt St	Washington St	117	6	1.2	**325**		●
36	Ash St	5 Mile Rd	Rowan Ave	70	3	0.6	**324**		
37	Thor St	3rd Ave	9th Ave	41	2	0.5	**320**		
38	Wellesley Ave	Alberta St	Oak St	48	2	0.5	**306**		●
39	5th Ave	Chandler St	Arthur St	52	2	0.5	**298**		
40	Rowan Ave	Belt St	Madison St	63	3	0.7	**297**	●	
41	Garland Ave	Hemlock St	Monroe St	108	3	0.9	**281**		
42	Spokane Falls Blvd	Post St	Division St	66	2	0.6	**281**		
43	Market St	Euclid Ave	Wellesley Ave	86	4	1.0	**281**		
44	3rd Ave	Nelson St	Havana St	89	4	1.0	**277**	●	●
45	Francis Ave	Freya St	Crestline St	69	4	1.0	**275**	●	

	Street Name	From	To	All Crashes	FSI[1] Crashes	Length (miles)	Severity Score	Bike HIN	Ped HIN
46	Central Ave	Nevada St	Division St	47	3	0.7	**273**		
47	Northwest Blvd	Milton St	Maple St	92	3	0.9	**270**		
48	4th Ave	Jefferson St	Chandler St	80	4	1.1	**265**		
49	Crestline St	Empire Ave	Vanetta Ave	132	7	1.9	**252**		
50	Trent Ave	MLK Jr Blvd	Crestline St	53	1	0.5	**245**	●	
51	Wellesley Ave	Crestline St	Freya St	44	4	1.0	**242**		●
52	44th Ave	Stone St	Achilles St	22	3	0.8	**231**	●	
53	Trent Ave	Freya Way	Waterworks St	75	3	1.0	**212**	●	
54	Euclid Ave	Wall St	Lidgerwood St	20	3	0.7	**210**	●	
55	Airport Dr	Flint Rd	US 2	76	3	1.3	**177**		
56	Freya St	Francis Ave	Wellesley Ave	27	3	1.0	**173**		
57	Washington St	Spokane Falls Blvd	1st Ave	54	1	0.24	**65**	●	

[1] FSI = Fatal and Serious Injury

THE INTERSECTION HIN ENCOMPASSES INTERSECTIONS WHERE 25% OF INTERSECTION-RELATED FSIS OCCURRED. THESE 58 INTERSECTIONS REPRESENT ONLY 0.8% OF THE CITY'S INTERSECTIONS.

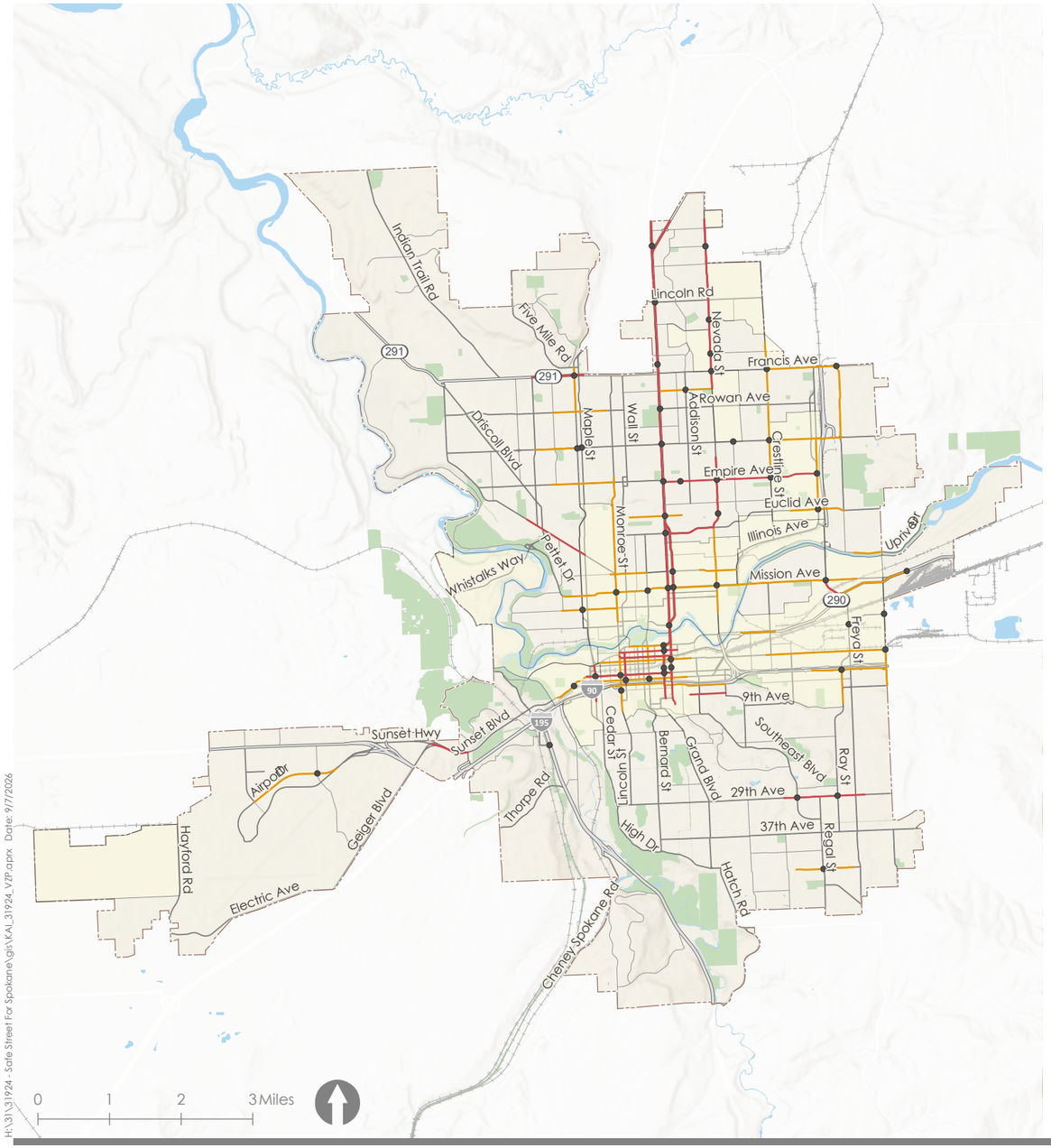
Table 20 identifies the highest-scoring intersections; together, these intersections also account for 25% of fatal and serious injury intersection crashes. **Figure 11** illustrates the location of these intersections and the HIN corridors.

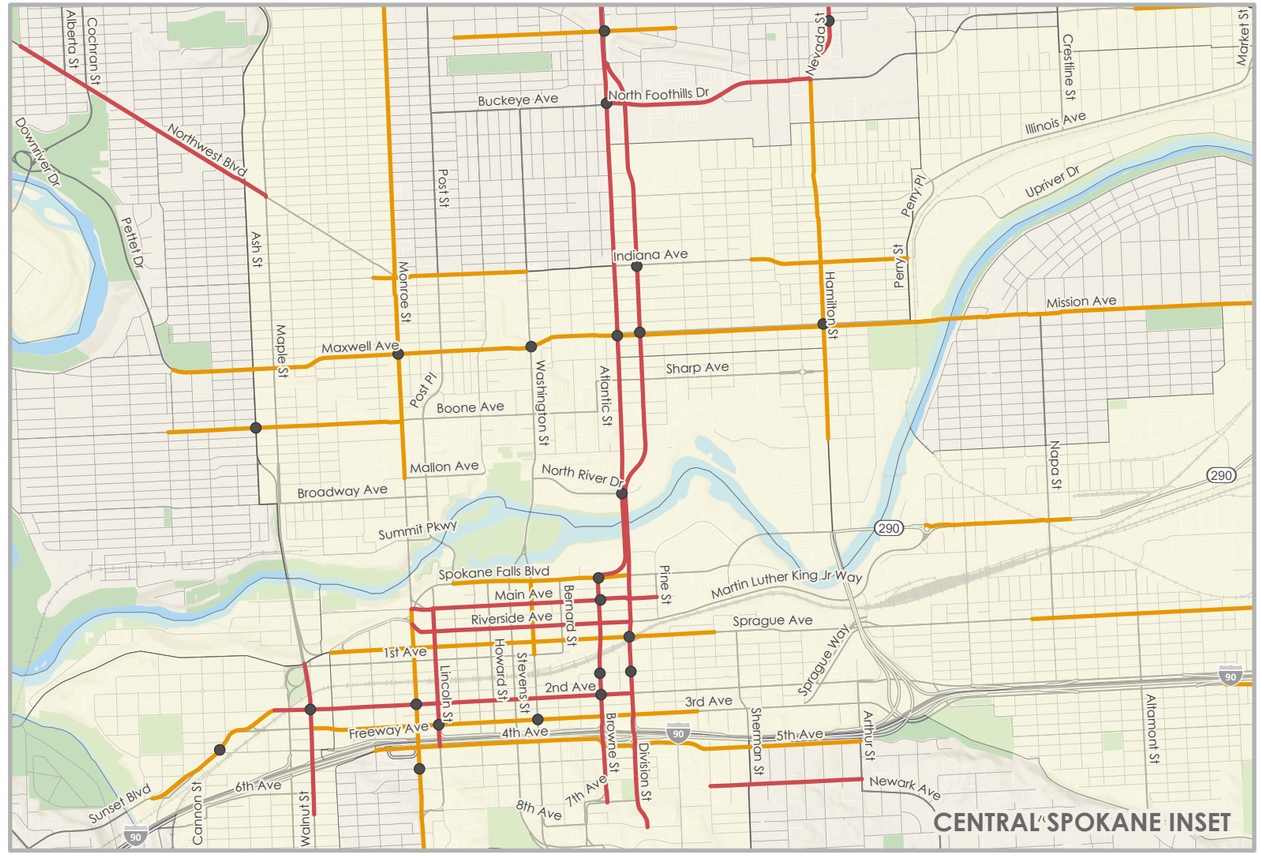
Table 20. Intersection HIN Results (All Modes)

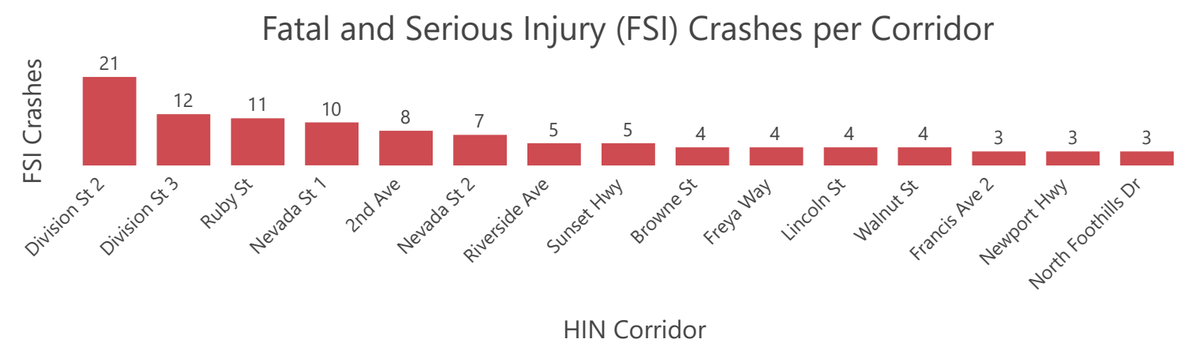
	Intersection	All Crashes	FSI[1] Crashes	Severity Score
1	Greene St / Mission Ave	77	3	**237**
2	Division St / Foothills Dr / Buckeye Ave	71	3	**227**
3	Monroe St / 2nd Ave	54	3	**223**
4	Freya St / Francis Ave	26	4	**214**
5	Division St / Euclid Ave	23	4	**204**
6	Regal St / 44th Ave	38	3	**199**
7	Monroe St / Maxwell Ave	39	3	**195**
8	Walnut St / 2nd Ave	39	3	**188**
9	Francis Ave / Crestline St	35	3	**179**
10	Division St / Sprague Ave	61	2	**175**
11	Market St / Garland Ave	33	3	**174**
12	Washington St / Mission Ave / Maxwell Ave	28	3	**174**
13	Browne St / 2nd Ave	63	2	**173**
14	Airport Dr / Spotted Rd	32	3	**173**
15	Ruby St / Indiana Ave	57	2	**169**
16	Thor St / 3rd Ave	60	2	**164**
17	Division St / Lincoln Rd / Cascade Way	54	2	**162**
18	Monroe St / 5th Ave	19	3	**162**
19	Division St / Pacific Ave	19	3	**161**
20	Nevada St / Euclid Ave	20	3	**159**
21	Empire Ave / Lidgerwood St	11	3	**157**
22	Division St / Mission Ave	58	2	**155**
23	Division St / Garland Ave / Empire Ave	47	2	**154**
24	Division St / North River Dr	43	2	**154**
25	Maple St / Wellesley Ave	46	2	**153**
26	Market St / Euclid Ave	50	2	**143**
27	Southeast Blvd / 29th Ave	34	2	**139**
28	Empire Ave / Nevada St	39	2	**138**
29	Browne St / Pacific Ave	36	2	**136**

	Intersection	All Crashes	FSI[1] Crashes	Severity Score
30	Division St / Country Homes Blvd	30	2	**136**
31	Division St / Wellesley Ave	70	1	**136**
32	Nevada St / Lyons Ave	28	2	**131**
33	Ash St / Francis Ave	39	2	**128**
34	Division St / Houston Ave	23	2	**127**
35	3rd Ave / Lincoln St	24	2	**127**
36	Broadway Ave / Havana St	25	2	**125**
37	Addison St / Central Ave	24	2	**124**
38	Wellesley Ave / Crestline St	28	2	**123**
39	Wellesley Ave / Perry St	26	2	**123**
40	Crestline St / Empire Ave	27	2	**121**
41	Francis Ave / Nevada St	72	1	**120**
42	Nevada St / Jay Ave	19	2	**119**
43	Washington St / 3rd Ave	20	2	**119**
44	Sunset Blvd / 4th Ave	23	2	**118**
45	Browne St / Spokane Falls Blvd	30	2	**118**
46	Division St / Rowan Ave	20	2	**118**
47	Ruby St / Mission Ave	61	1	**116**
48	Ash St / Boone Ave	19	2	**116**
49	Freya St / Alki Ave	27	2	**115**
50	Freya Way / Trent Ave	21	2	**115**
51	Ash St / Wellesley Ave	57	1	**115**
52	Browne St / Main Ave	22	2	**114**
53	Ray St / 29th Ave	21	2	**113**
54	Nevada St / Sharpsburg Ave	14	2	**113**
55	US 195 / 16th Ave	34	2	**113**
56	Sprague Ave / Havana St	43	1	**113**
57	Hamilton St / Mission Ave	51	1	**112**
58	Trent Ave / Waterworks St	15	2	**112**

[1] FSI = Fatal and Serious Injury







HIN Corridors

- Primary
- Secondary

- HIN Intersections
- Areas of Persistent Poverty (S1701)

Figure 11

High Injury Network (HIN) Corridors

Data Source: 2025 ACS 5-Year Estimates Table S1701

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THE PEDESTRIAN HIN CAPTURES 50% OF PEDESTRIAN FSI CRASHES AND COVERS 3.2% OF THE CITY'S NETWORK / 34 CENTERLINE MILES.

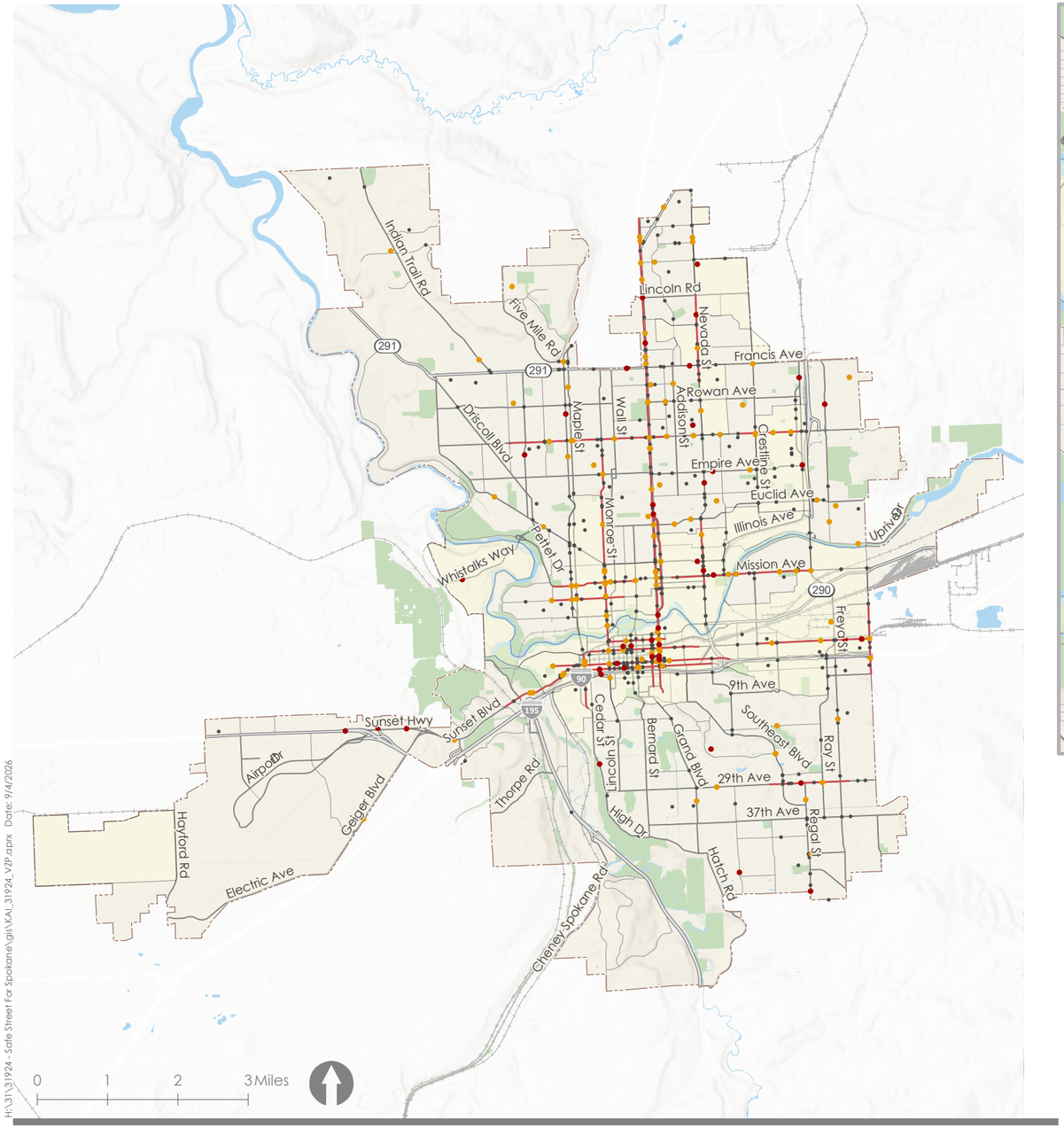
Table 21 and **Figure 12** detail the corridors with the highest severity scores for pedestrian only crashes (these crashes are also accounted for the All Modes HIN).

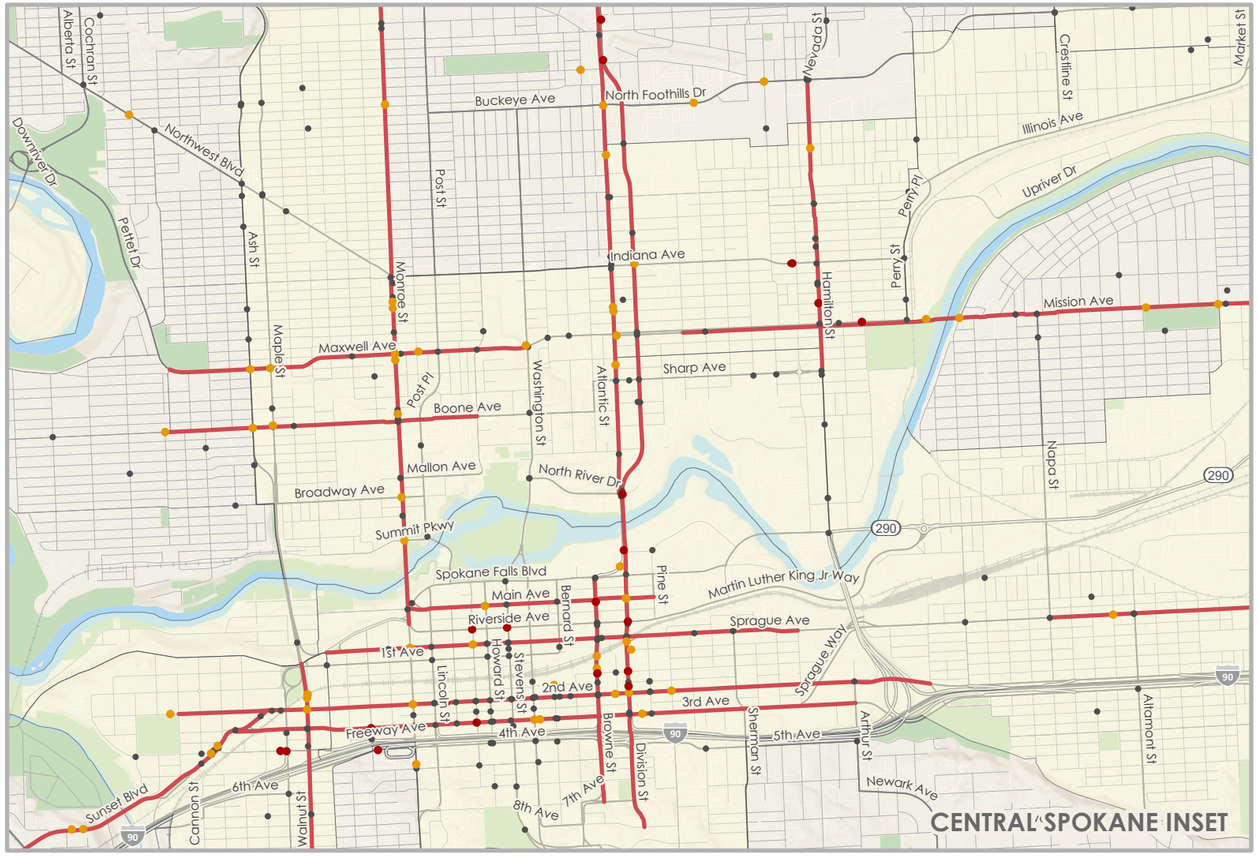
Table 21 Pedestrian HIN Corridor Results

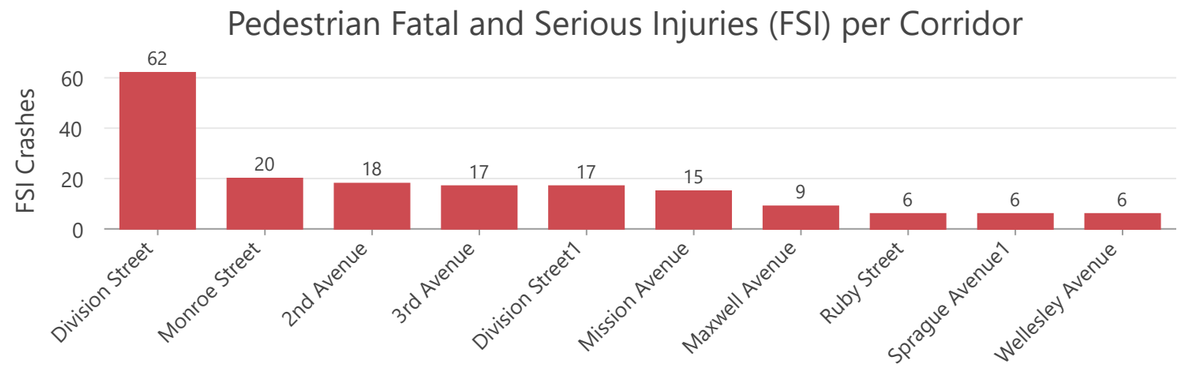
	Corridor	From	To	All Pedestrian Crashes	Pedestrian FSI[1] Crashes	Length (Miles)	Severity Score
1	**Browne St**	Spokane Falls Blvd	7th Ave	27	4	2.5	**698**
2	**Division St**	8th Ave	North River Dr	30	10	5.7	**539**
3	**2nd Ave**	Perry St	Chestnut St	59	6	1.1	**451**
4	**Sprague Ave**	Scott St	Cedar St	19	2	0.7	**244**
5	**3rd Ave**	Sunset Blvd	Arthur St	25	5	2.8	**243**
6	**Maxwell Ave**	Belt St	Washington St	14	5	2.1	**218**
7	**Monroe St**	Heroy Ave	Riverside Ave	26	8	2.2	**187**
8	**Sunset Blvd**	2nd Ave	Rosamond Ave	11	3	1.6	**186**
9	**Walnut St**	11th Ave	Riverside Ave	7	4	1.2	**180**
10	**Wellesley Ave**	A St	Lidgerwood St	21	6	2.0	**178**
11	**Nevada St**	Lincoln Rd	Central Ave	11	1	1.2	**176**
12	**Division St**	Westview Ave	North River Dr	47	20	1.5	**166**
13	**Ruby St**	North River Dr	Cleveland Ave	11	2	1.6	**151**
14	**Hamilton St**	North Foothills Dr	Sharp Ave	9	1	1.2	**146**
15	**Sprague Ave**	Havana St	Napa St	11	5	1.0	**138**
16	**Boone Ave**	Chestnut St	Howard St	7	2	1.0	**135**

	Corridor	From	To	All Pedestrian Crashes	Pedestrian FSI[1] Crashes	Length (Miles)	Severity Score
17	**Main Ave**	Monroe St	Pine St	5	3	0.8	**123**
18	**Mission Ave**	Lidgerwood St	Greene St	13	5	1.0	**121**
19	**Havana St**	Hartson Ave	Broadway Ave	7	2	1.1	**120**
20	**29th Ave**	Martin St	Rebecca St	6	2	0.8	**106**
21	**Wellesley Ave**	Pittsburg St	NSC On Ramp	5	2	1.0	**101**

[1] FSI = Fatal and Serious Injury







Pedestrian HIN Corridors

Areas of Persistent Poverty (S1701)

Pedestrian-Involved Crashes

- Fatal Injury
- Serious Injury
- Other Crashes

Figure 12

Pedestrian High Injury Network (HIN) Corridors

Data Sources: WSDOT Crash Data 2021-2025
and 2025 ACS 5-Year Estimates Table S1701

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THE BICYCLIST HIN CAPTURES 50% OF BICYCLIST FSI CRASHES AND COVERS 3.4% OF THE CITY'S NETWORK / 36 CENTERLINE MILES.

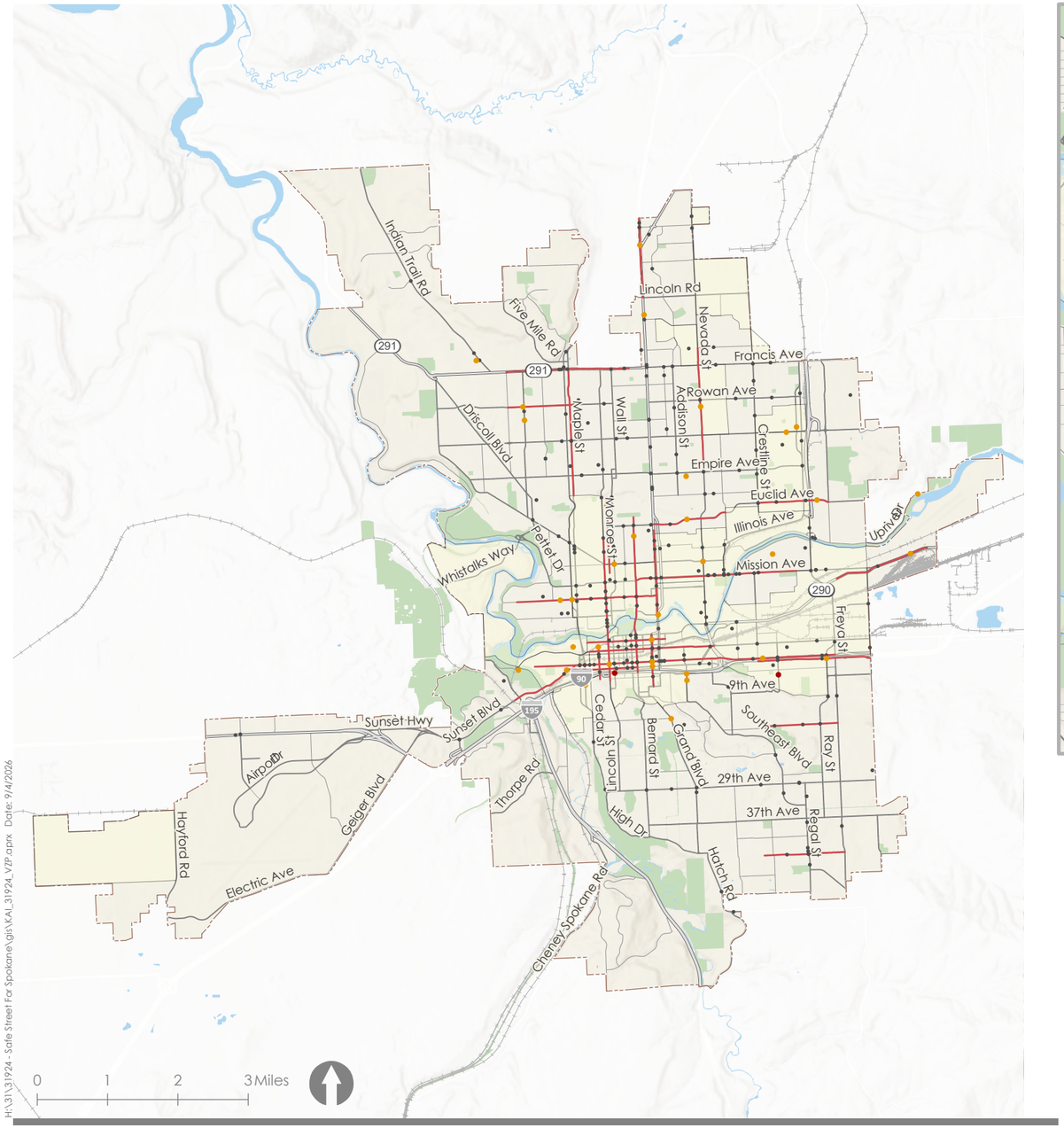
The Bicyclist HIN is illustrated in **Figure 13** and **Table 22** details the corridors with the highest severity scores (these crashes are also accounted for the All Modes HIN)

Table 22. Bicycle HIN Corridor Results

	Corridor	From	To	All Bicycle Crashes	Bicycle FSI Crashes	Length (Miles)	Severity Score	All Mode HIN
1	Browne St	Spokane Falls Blvd	7th Ave	11	3	0.7	**269**	●
2	Jefferson St	5th Ave	Riverside Ave	4	1	0.3	**127**	
3	2nd Ave	Freya St	Coeur d'Alene St	28	2	0.5	**117**	●
4	Mission Ave	Regal St	Washington St	12	0	4.3	**96**	●
5	Monroe St	Jackson Ave	Bishop Ct	11	1	2.3	**88**	●
6	Division St	York Ave	North River Dr	6	0	2.0	**83**	●
7	3rd Ave	Sunset Blvd	Washington St	5	0	1.2	**80**	●
8	Division St	Westview Ave	Lincoln Rd	4	1	1.0	**71**	●
9	Washington St	4th Ave	Waverly Pl	8	1	1.1	**63**	●
10	Boone Ave	A St	Division St	6	2	2.2	**60**	●
11	Sunset Blvd	2nd Ave	Audubon St	3	1	2.0	**59**	●
12	17th Ave	Martin St	Freya St	3	0	1.0	**58**	
13	44th Ave	Napa St	Freya St	3	0	1.0	**52**	●
14	3rd Ave	Napa St	Havana St	4	1	1.1	**50**	●
15	Francis Ave	Whitehouse St	A St	4	0	1.6	**46**	●
16	Sprague Ave	Erie St	Cedar St	4	0	1.7	**45**	●
17	Rowan Ave	A St	Cedar St	2	1	1.8	**40**	●

	Corridor	From	To	All Bicycle Crashes	Bicycle FSI Crashes	Length (Miles)	Severity Score	All Mode HIN
18	Euclid Ave	Crestline St	Freya St	2	1	1.0	**40**	●
19	North Foothills Dr	Perry St	Division St	2	1	1.0	**37**	●
20	Lincoln St	Augusta Ave	Cora Ave	2	1	1.1	**37**	●
21	Main Ave	Cedar St	Pine St	3	1	1.1	**36**	●
22	Maple St	Courtland Ave	Francis Ave	3	0	1.1	**33**	
23	Trent Ave	Sycamore St	Koren St	2	1	1.8	**29**	●
24	Nevada St	Lyons Ave	Empire Ave	2	1	1.4	**23**	●

[1] FSI = Fatal and Serious Injury



Bicyclist Fatal and Serious Injury (FSI) Crashes per Corridor

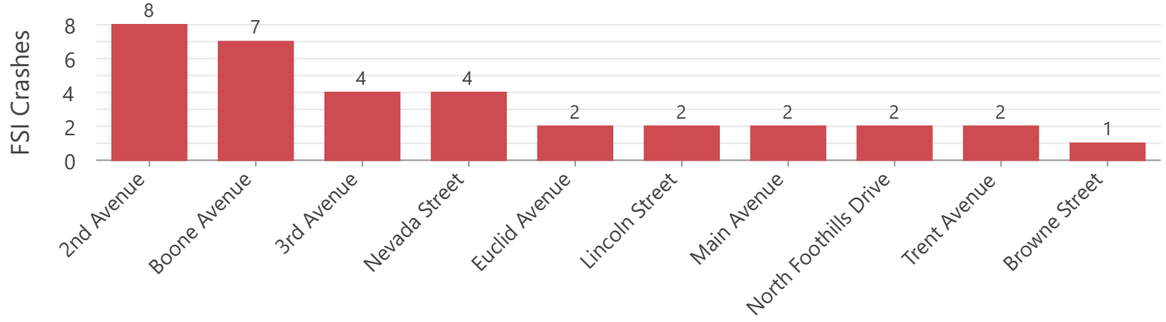


Figure 13

Bicyclist High Injury Network (HIN) Corridors

Data Sources: WSDOT Crash Data 2021-2025
and 2025 ACS 5-Year Estimates Table S1701

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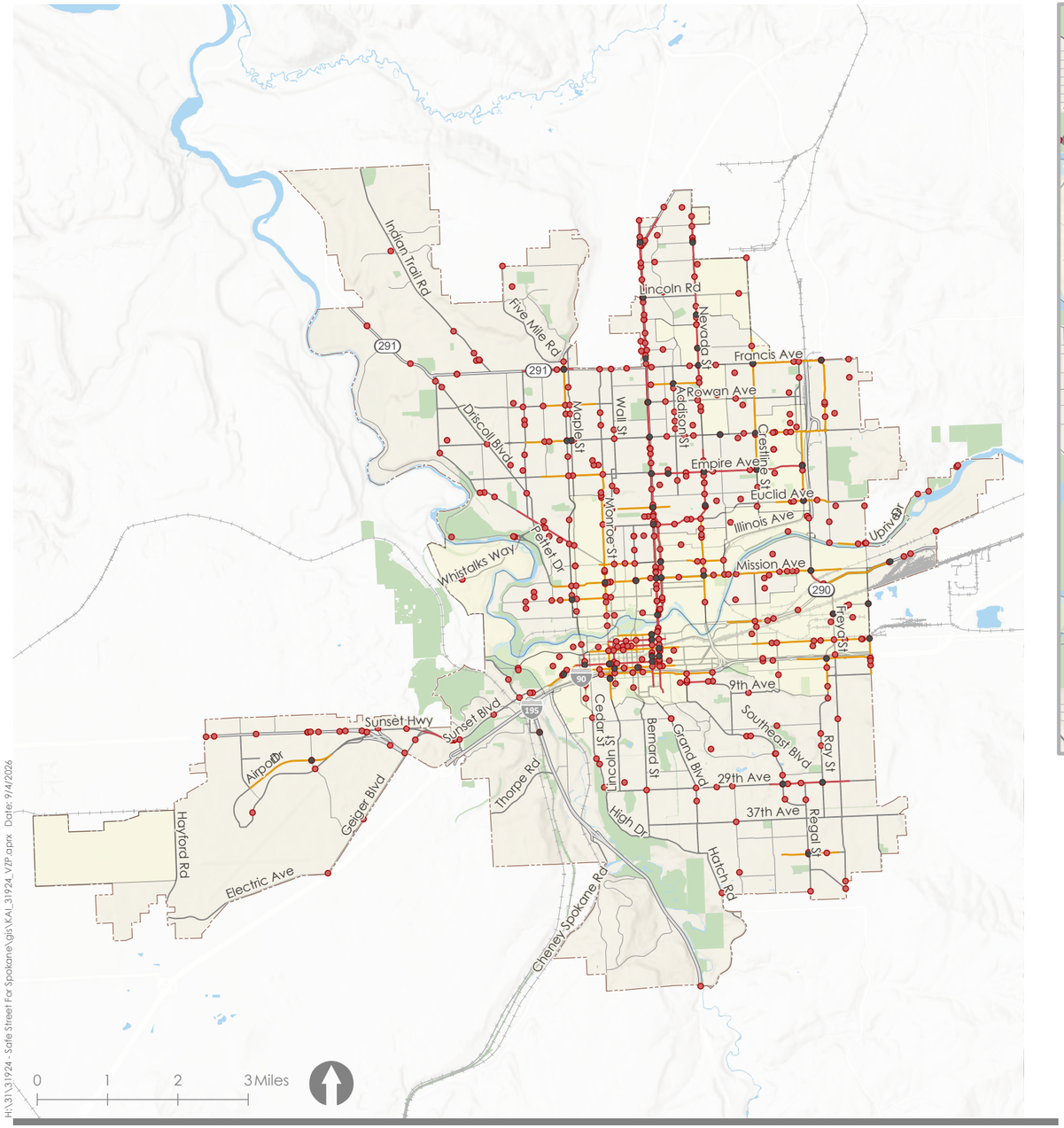
Underserved Areas Analysis

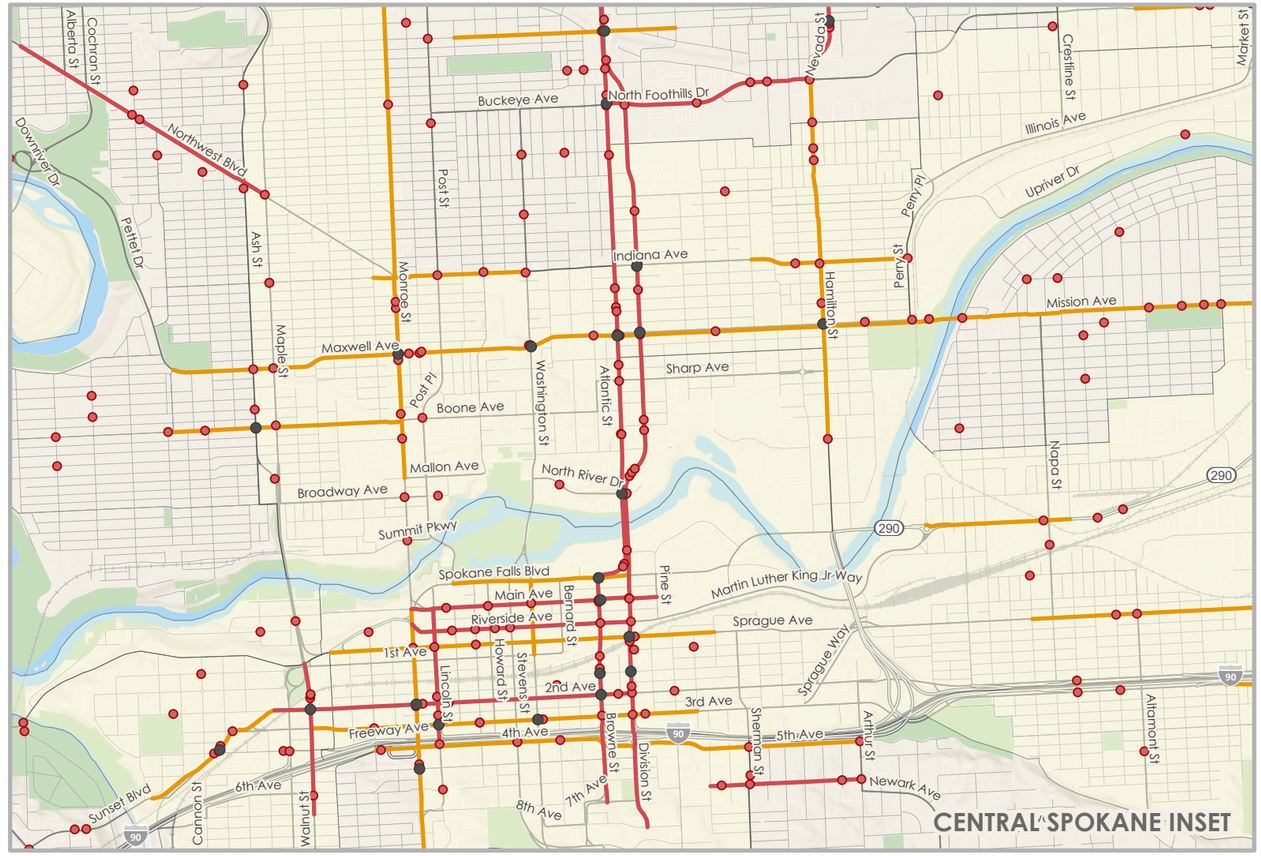
This section identifies areas on the roadway network where underserved populations may face a disproportionate risk of serious injury or fatal crashes. An underserved area is defined within the SS4A Notice of Funding Opportunity as census tracts with a poverty rate of at least 20% in the 2014-2018 American Community Survey (ACS). These results were calculated in GIS using a 25-foot buffer around crash locations and roadway segments. **Figure 14** illustrates the relationship between the HIN and Areas of Persistent Poverty. **Table 23** presents these results.

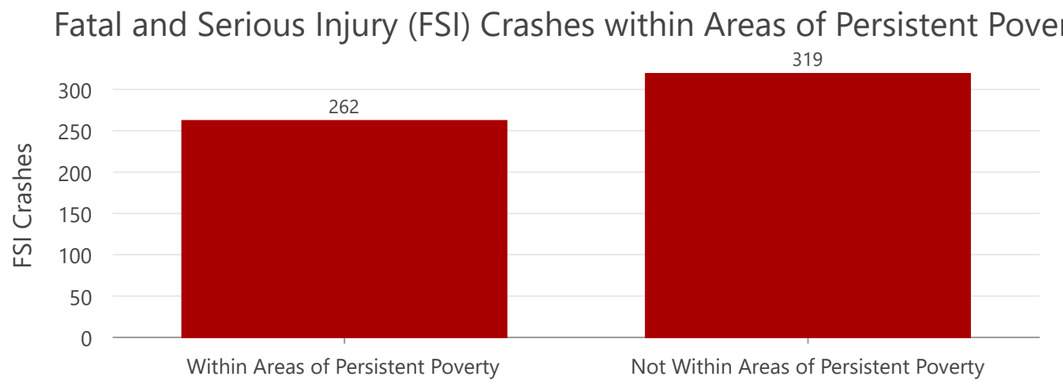
OF THE TOTAL CITY LAND AREA, 21% FALLS WITHIN AN AREA OF PERSISTENT POVERTY; HOWEVER, 45% OF FSI CRASHES AND 66% OF THE PRIMARY HIN CORRIDORS FALL WITHIN THESE AREAS.

Table 23 Areas of Persistent Poverty Analysis Results

Criteria	City Limits of Spokane	Fatal and Serious Injury Crashes	Primary HIN	Secondary HIN
Proportion within Underserved Areas	21%	45%	66%	72%
Proportion not within Underserved Areas	79%	55%	34%	28%







HIN Corridors

- Primary
- Secondary

- HIN Intersections
- Fatal and Serious Injury (FSI) Crashes
- Areas of Persistent Poverty (S1701)

Figure 14

Areas of Persistent Poverty and High Injury Network (HIN) Corridors

Data Source: 2025 ACS 5-Year Estimates, Table S1701
Data Source: WSDOT Crash Data 2021-2025

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Countermeasure Toolbox

To develop safer roads, planners and engineers rely on proven countermeasures to mitigate crashes based on contributing circumstances and roadway context. **FHWA's Safe System Roadway Design Hierarchy** organizes engineering and infrastructure-based countermeasures so practitioners can identify and prioritize treatments during project development:

- Tier 1: Remove severe conflicts
- Tier 2: Reduce vehicle speeds
- Tier 3: Manage conflicts in time
- Tier 4: Increase attentiveness and awareness

The roadway design hierarchy, together with NCHRP Report 1111: *Diagnostic Assessment and Countermeasure Selection: A Toolbox for Traffic Safety Practitioner* was used to develop the Countermeasures Toolbox for use in selecting countermeasures for safety improvement projects (Table 23**).** The crash modification factors (CMFs) represent the expected change in crash frequency after a countermeasure is installed.

- For example, a countermeasure with a CMF of 0.45 is expected to reduce crashes by 55%, meaning the location would experience 45% of its previous crash total over the same period.

Table 23 Countermeasure Toolbox

ID #	Countermeasure	CMF	Crash Type	Severity
Tier 1 Remove Severe Conflicts				
9157	Convert intersection to roundabout	0.56	All	Injury
11522	Conversion of stop-controlled intersection to mini roundabout	0.63	All	All
209	Conversion of signalized intersection into single- or multi-lane roundabout	0.65	All	All
10737	Install bicycle lanes	0.43	All	All
10741	Install bike lanes with reduced vehicle lane width	0.73	All	All
11246	Install sidewalk	0.59	Veh-Ped	All
175	Add raised median with marked crosswalk	0.54	Veh-Ped	All
176	Add raised median without marked crosswalk	0.61	Veh-Ped	All
2841	Conversion from 4 lanes to 3 lanes	0.53	All	All
9250	Install shared-use pathway	0.75	Veh-Bike	All
2220	Install raised median	0.45	Angle	All
9681	Install safety edge treatment	0.7	Run off road	All
179	Reduce number of driveways	0.75	All	Injury
289	Dedicated right turn lanes	0.74	All	All
269	Dedicated left turn lanes	0.53	All	All
10856	Convert intersection to median U-turn (MUT) intersection	0.68	Angle	All
10762	Convert Diamond Interchange to Diverging Diamond Interchange (DDI)	0.56	All	Injury
11552	Separated/protected bike lanes	0.55	All	All
12100	Protected intersection	0.67	Veh-Ped/Veh-Bike	All
7900	Improve pavement friction at curve	0.76	All	All
Tier 2: Reduce Vehicle Speeds				
79	Changeable speed warning signs	0.59	All	All
587	Corridor-specific traffic calming	0.82	All	Injury
7825	Convert 12-foot lanes to 11-foot lanes	0.76	All	All
**	Install curb extensions	0.89	All	All
132	Speed hump	0.6	All	Injury

ID #	Countermeasure	CMF	Crash Type	Severity
136	Install raised pedestrian crosswalks	0.55	Veh-Ped	All
10660	Speed safety cameras	0.79	All	Injury
2430	Gateway treatments	0.68	All	All
Tier 3: Manage Conflicts in Times				
319	Install traffic signal	0.77	All	All
9021	Install PHB with advanced yield or stop markings	0.43	Veh-Ped	All
9903	Implement leading pedestrian interval	0.81	Veh-Ped	All
9892	Change permissive left-turn phasing to protected only or protected/permissive	0.67	All	All
5244	Pedestrian exclusive phase	0.65	Veh-Ped	All
Tier 4: Increase Attentiveness and Awareness				
7694	Doghouse to FLA for lefts	0.93	All	All
89	Add lane lines on multilane roadway segments	0.82	All	All
11026	Improve street lighting illuminance and uniformity	0.68	All	All
2372	Stopbars – increase pavement marking retro-reflectivity	equation	All	All
3258	Install colored bike lanes at signalized intersections	0.61	Veh-Bike	All
4123	High visibility crosswalk markings	0.6	Veh-Ped	All
441	Provide intersection illumination	0.41	Veh-Ped	S, M
6885	Speed feedback sign	0.95	All	All
9017	Install advanced yield or stop markings and signs	0.75	Veh-Ped	All
9024	Install RRFB	0.53	Veh-Ped	All
3092	Install bicycle boulevard	0.37	Veh-Bike	All
136	Install raised pedestrian crosswalks	0.55	Veh-Ped	Injury
2438	Enhanced delineation for horizontal curves	0.84	Run-off road	Injury
1410	Add 3-inch yellow retroreflective sheeting to signal backplates	0.85	All	All
8867	Implement systemic signing and marking improvements at stop-controlled intersections	0.9	All	Injury

*This is not an exhaustive list of all applicable countermeasures. FHWA's Safe System Roadway Design Hierarchy, and NCHRP Report 1111 should be referenced when identifying and prioritizing countermeasures for a specific project or location.

**The CMF Clearinghouse currently lacks a Curb Extension treatment, however a recent 2026 public did develop the reported CMF value. Erick Guerra, Yihong Hu, and Ariel Ben-Amos, "The Effects of Curb Extensions on Traffic Crashes and Injuries," *Transportation Research Record*, OnlineFirst, 2026, https://doi.org/10.1177/03611981261425971.



QUICK BUILD GUIDE

2026

CITY OF SPOKANE™

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Executive Summary

With increasing fatal and serious injury crashes on Spokane streets and disproportionate impacts on the most vulnerable road users, Mayor Lisa Brown passed the Janet Mann Safe Streets Executive Order in July of 2024 in conjunction with the Spokane City Council's Janet Mann Safe Streets Now resolution. These directives require rapid installation of roadway facilities and treatments toward a safe, comfortable, and connected urban mobility network. These directives prioritize quick-build design approaches that use temporary, semi-temporary and moveable materials to quickly address key locations and test the effectiveness of roadway changes.

This *Quick-Build Guide (Guide)* describes the City's approach to carrying out these quick-build strategies. The Guide identifies:

What is a Quick Build
- Intro
- Goals

Step 1: Understanding the Project Planning and Delivery process
- City Project Types
- Gather Team/Roles and Responsibilities
- Project Selection
- Community Engagement/Stakeholders
- Procure Services
- Funding

Step 2: Design
- Design Principles
- Quick Build Catalog
- Materials

Step 3: Build and Maintain
- Construction
- Maintenance

Step 4: Evaluation
- Gather Data and Evaluate

Quick-Build Project Development Overview

The City's Integrated Capital Management (ICM) team will lead project development, with support from Planning, Engineering Services, and the Street Department. Over the long term, project management will transition to the department best suited to manage each installation. Community input is integrated throughout the process to help inform priorities and refine project concepts.

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Introduction

Mayor Lisa Brown and the Spokane City Council have adopted executive orders and resolutions to accelerate the delivery of transportation improvements that enhance safety for vulnerable road users, including people who walk, bike, roll, use adaptive devices, and take transit. These actions respond to a decade-long increase in fatal and serious injury crashes and support the City's commitment to eliminating traffic fatalities by 2037 through its City's Vision Zero goals.

To advance these goals, the City is working to make transportation projects faster and more cost effective to deliver while fostering meaningful community collaboration.

Quick-build projects are low-cost, rapidly implementable street improvements that can support safer routes to school, improve access to essential services, make everyday trips more comfortable, and contribute to overall neighborhood livability. They typically use temporary or semi-permanent materials installed on existing pavement. They may remain in place for a week, a season, or multiple seasons, but are durable enough to demonstrate how the design performs under weather, maintenance, and daily travel conditions. This approach allows the City and community to test concepts before investing in permanent improvements, helping address safety concerns while reducing the risk of committing significant public resources to solutions that may not achieve the intended outcomes.

1 Improve Safety

by ensuring that all roadway users follow predictable behavior supported by good infrastructure design and by reducing the number of conflicts.

2 Increase Access

by filling network gaps between amenities and services people access everyday including businesses, schools, parks, and offices.

3 Improve User Experience

by developing creative solutions for improving network usability including plantings, art, lighting, and trees.

4 Engage Community

by involving the community at the appropriate times to assess the outcomes of the adaptive design solutions and add unique perspective to the user experience.

5 Explore Opportunities

for improving the project delivery process and finding ways to be creative in design solutions to safety problems.

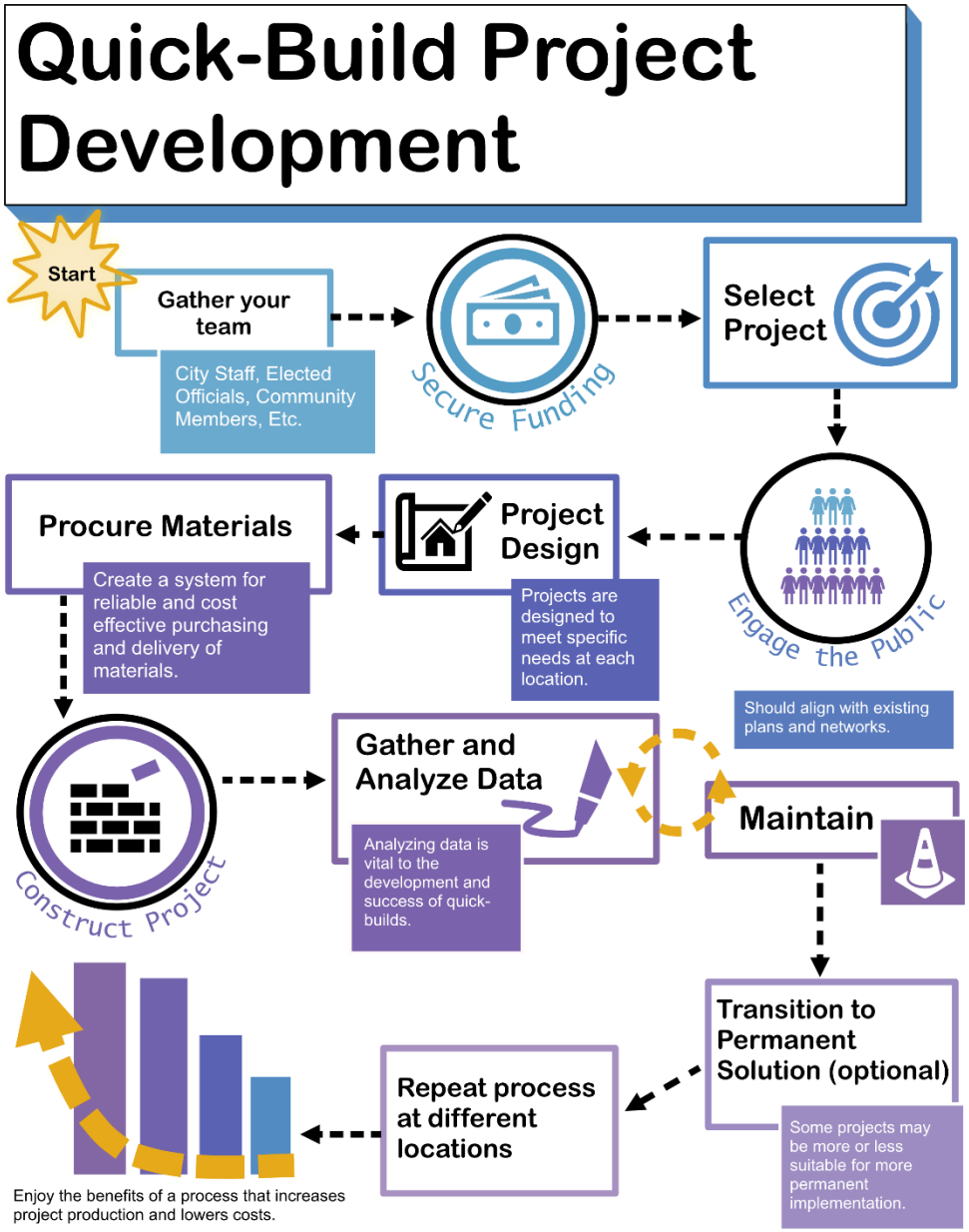
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Step 1: Understanding the Project Delivery Process

This section outlines the City's process for consistent, cost-effective quick-build delivery. Clearly understanding roles and the process helps the community know how projects move forward, who is responsible for key decisions, and where their input can shape outcomes. It addresses:

- City project types
- City staff roles
- Project selection
- Community engagement
- Procurement (Contracting and materials)
- Construction
- Evaluation
- Funding



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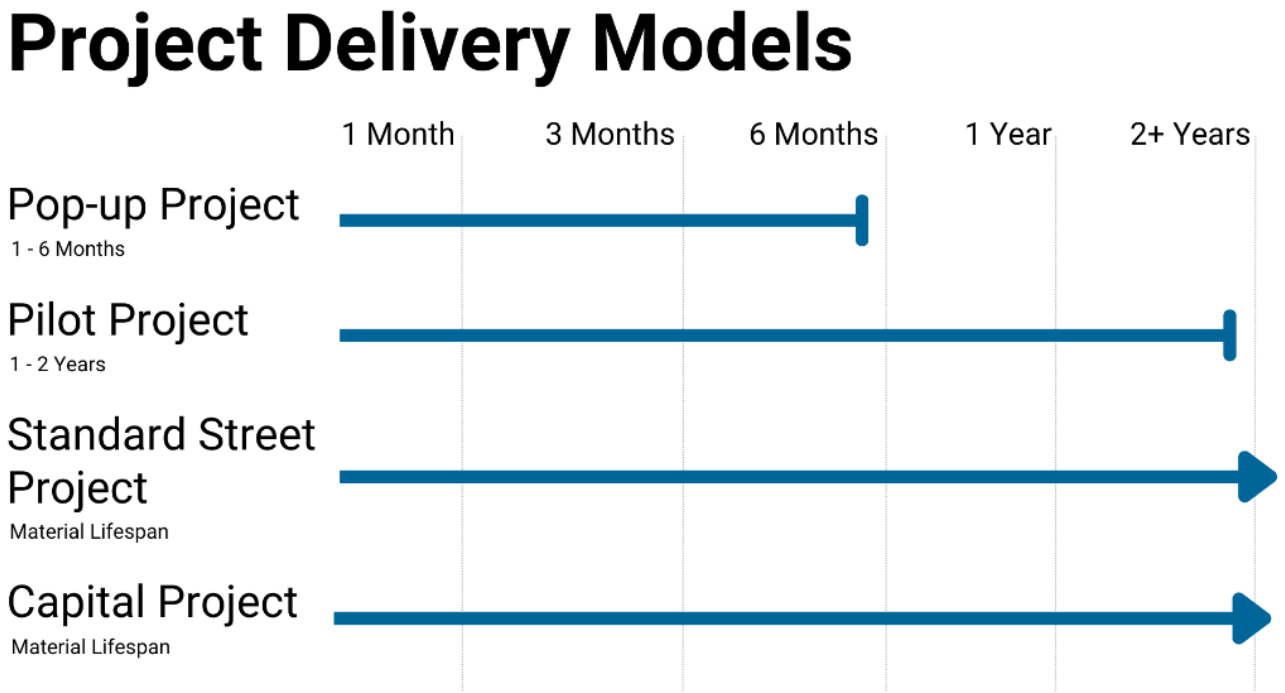
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City Project Types

Understanding the City's different project types is important to implementing quick-build projects effectively. Quick-build strategies are most successful when they are aligned with the appropriate project pathway, decision points, funding opportunities, and staff roles from the outset.

The city has four general project types based on level of complexity: **Pop-up, Pilot** (collectively referred to as Quick-Builds), **Street, and Capital**.

While Pop-up and Pilot projects can often be planned and implemented within one year and with minimal investment, Street projects typically require one to two years of planning and programming before construction. Capital projects generally take several years to plan, fund, design, and deliver through the Six-Year Comprehensive Street Program and coordination with local, regional, state, and federal partners.



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Pop-Up Quick Build

Pop-up, or demonstration, projects are temporary improvements that can be installed, modified, or removed within days. They help agencies respond quickly to community or safety needs, test new designs with minimal disruption, and use low-cost, readily available materials. Depending on project goals and material durability, they may last from a weekend to six months and are typically planned and implemented within three months.

During and after installation, agencies should collect data, engage the public, and evaluate project performance to inform future design, funding, and long-term implementation decisions. Successful demonstration projects may advance to a Pilot Project, using more durable materials to test a treatment over a longer period, or they may proceed directly to a Street or Capital Project.

Lifespan

0-6 months

Planning Timeline

1 - 3 months

Budget

$

Funding

Local businesses, WheelShare, Local funding sources

Public Engagement

As necessary - limited to affected sites and adjacent residents, businesses, and property owners

Permitting

Special event permit



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Pilot Quick Build

Pilot projects are temporary installations that use more durable materials than a pop-up to test how a treatment works over a longer period of time. Pilots help agencies better understand operations, maintenance needs, user behavior, and public support while allowing changes if needed. Pilots typically stay in place for six months to a couple of years and can be paired with resurfacing, maintenance, or striping work to reduce costs. A pilot may be installed directly or after a successful pop-up project, depending on project goals, community needs, funding, and long-term implementation decisions.

Agencies should collect data, gather public input, and evaluate performance during and after the pilot. Successful pilot projects can provide the foundation for permanent Street or Capital Projects, helping agencies refine designs and build support before long-term implementation.

Lifespan

1 – 2+ years

Planning Timeline

3 month – 18 months

Budget

$-$$

Funding

Traffic calming, WheelShare, Grants, Various allocated funding

Public engagement

Most projects originate from pre-existing planning efforts therefore minimal engagement should be needed. Engagement should focus on informing the community as to what projects are being done and when they will be completed.



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Street Project

Street projects are delivered annually on local access streets, collectors, and arterials based on pavement conditions and need. Common improvements include fog seals, chip seals, grind and overlay (milling and resurfacing), pavement repairs, curb ramp upgrades, lane markings, crosswalks, bicycle facilities, signage, and pavement symbols. They may trigger curb ramp reconstruction to meet ADA requirements.

Pop-up and pilot projects can often be incorporated into street projects if they primarily consist of striping, signage, and pavement markings. Existing pop-ups and pilots can also be elevated into more permanent treatment as part of street projects. This approach can reduce costs, leverage existing funding, and transition temporary treatments into longer-lasting infrastructure.



Lifespan

Material Dependent – 5+ years

Planning Timeline

1 Year

Budget

$$$

Funding

Property taxes

Public engagement

Public Notice

Approvals

Local Legislative/administrative bodies

Public notice

Approvals

Local legislative/ administrative bodies.

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Capital Project

Capital projects are major infrastructure investments that typically take several years to plan, fund, design, and construct. These multi-agency projects often involve public engagement, environmental review, engineering, and significant funding commitments. Common improvements include roadway reconstruction, intersection redesigns, utility and drainage upgrades, permanent bicycle and pedestrian facilities, and streetscape enhancements. Most are identified through the City's Comprehensive Plan and Six-Year Comprehensive Street Program.

While not all quick-build projects become part of capital projects, many inform future investments by demonstrating need, effectiveness, and community support.



Lifespan

Material Lifespan

Planning Timeline

2 – 10 Years

Budget

$$$$

Funding

Federal and State funding with local match, including federal, state and local funding mechanisms.

Public engagement

Extensive public engagement process from initial planning to implementation typically lasts 6-12 months. Significant board, commission, and advisory committee(s) time.

Approvals

Federal agencies, state agencies, and local legislative/ administrative bodies.

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Team Roles and Responsibilities

Quick-build projects require early coordination among City departments, decision-makers, and community partners so that responsibilities are clear, issues are resolved quickly, and projects can move efficiently from concept to installation.

- **Administration and Policy:** Provides over-arching goals and identifies program purpose.
  - Mayor's Office – Policy Advisors
  - Council Office – Policy Staff
- **Coordination and Plan:** Identifies projects, feasibility, and problem-solves approaches to implementation.
  - Integrated Capital Management
  - Planning Department
  - Engineering Services
  - Streets Department
- **Design Team:** Designs the planned installations for construction.
  - Integrated Capital Management
  - Engineering Services
  - Streets Department
  - Planning Department
- **Public Involvement Team:** Schedules and leads public involvement meetings and outreach with neighborhoods.
  - Planning Department
  - Integrated Capital Management
  - Neighborhood Councils
  - Business Owners
  - City Communication Team
  - Representatives from community organizations
- **Procurement Team:** Engages design, engineering and construction support (as necessary) and procures specialized materials for construction.
  - Purchasing & Contracts
  - City Attorney's Office
  - Integrated Capital Management
  - Engineering Services
  - Streets Department
  - Planning Department
- **Installation Team:** Leads construction and implementation activities.
  - Engineering Services
  - Streets Department
  - Contractors as needed
  - Planning as needed
- **Evaluation Team:** Monitors project effectiveness and identifies adjustments needed to support long-term success.
  - Integrated Capital Management
  - Streets Department
  - Planning Department

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Choose the Projects for Quick Build Design

Project Selection involves multiple departments working together to identify locations for quick-build projects. It will be shaped by ongoing planning, such as the City Council's 27 by 2027 resolution, Bicycle Priority Network, Traffic Calming Program, Comprehensive Plan, the Six-year Comprehensive Streets program, emerging traffic needs based on safety and data information, and funding availability. Ideally, quick-build projects will pair with programmed street or capital improvement projects to save costs.

Engage the Public

Community outreach will help residents understand how quick-build projects work together to improve travel choices, safety, access, and neighborhood connections. As projects are identified, the project team will host at least one round of community engagement organized around a small groups of nearby projects—typically 3 to 10 at a time—that form a continuous network or connect related neighborhoods, districts, and key destinations. The primary engagement will occur after project segments and preliminary design concepts have been developed, but before bidding and construction, so community input can help refine the projects before implementation.

After the primary engagement round, the project team will determine whether additional outreach is needed. If residents raise important concerns, the team will share updates through a second round of follow-up meetings and online opportunities. If major last-minute changes are needed, the team may hold a third round of engagement opportunities. When project changes could affect individual properties, the team may also hold meetings with impacted property owners.

For each project group, the City will host an in-person community meeting at an accessible location as close to the project area as possible. Project updates will be available online so community members can review materials and provide input even if they cannot attend in person. Participants will be invited to comment on how each project group can best serve local needs. Topics will include:

- Which neighborhoods, districts, and destinations each group of projects connects.
- Important places served, such as schools, parks, transit stops, businesses, and community services.
- How each segment helps build a stronger citywide transportation network.
- Community goals and priorities the projects support, such as safer streets, easier access, and better connections.
- What the proposed designs could look like and how they may affect people who walk, bike, roll, drive, use transit, or live nearby.
- Locations where smaller, flexible design improvements could help complete gaps in the network.
- Ideas for signs, wayfinding, branding, and communication

Procure Services

Procurement of services, goods and contractors depends on collaboration with Engineering Services and the City's

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Purchasing Department to identify strategies that are the most time-efficient and cost-efficient and to provide the Streets Department with sufficient time to prepare crews, materials, and equipment. Key procurement principles include:

- **Group projects:** Bundle similar small projects into one bid to improve pricing and consistency.
- **Decide early:** Finalize locations, designs, and construction approach by mid-winter to improve scheduling and reduce costs.
- **Aim for mid-winter bids:** Prepare final documents for mid-winter bidding to secure better prices and contractor availability.
- **Prioritize in-house resources:** Use City staff, equipment, and materials when available to reduce costs and speed delivery.
- **Use on-call or value blanket contracts – Small Works Rosters at $300,000 or less :** Build ongoing private partnerships allows to support clear communication, flexibility in scheduling, and consistency in project delivery.

Construct and Maintain

Proper construction and maintenance ensure installations remain safe, functional, and responsive throughout their lifespan. Guided by the principles of safety, affordability, and adaptability, project teams should construct and maintain projects in ways that maximize resource efficiency, support future modifications, and preserve public confidence. Regular inspections, material tracking, and community engagement help identify maintenance needs, evaluate performance, and inform design refinements over time. By combining ongoing stewardship with flexible implementation practices, quick-build projects can continue to meet community needs while providing valuable lessons for future improvements and long-term investments.

Assess and Evaluate

Evaluation is a critical step in the quick-build process to verify projects are meeting their intended goals and community needs. Evaluation should combine baseline and post-implementation quantitative and qualitative data, organized through a standardized performance matrix that tracks outcomes over the life of the project. Based on the results, a project may be removed, extended with minor modifications, or evolved into a more permanent investment that delivers long-term community benefits.

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Funding

Identify and secure funding early to support timely project delivery. The programs below offer flexible near-term funding strategies and opportunities to combine resources.

- **Use Paths and Trails / WheelShare Program funds** for bicycle, pedestrian, and shared-mobility improvements.
- **Coordinate with Traffic Calming Program projects** that can incorporate quick-build materials.
- **Coordinate with resurfacing and maintenance programs** to add striping, delineation, and low-cost safety treatments while crews are mobilized.
- **Evaluate Special District funding**, where projects support mobility, access, or economic development goals.
- **Pursue small grants**, such as the Bloomberg Asphalt Art Grant, for placemaking, pavement art, and demonstration projects.

Future Options

Establishing a reliable annual funding source will be critical for an ongoing quick-build program. Options include:

1. Spokane Investment Pool (SIP) loan / Interfund loan policy
2. Coordination with Street Bond projects
3. State and federal capital grants
4. Coordination with local resurfacing and maintenance programs

Key Short-Term Funding Characteristics

Immediately and in the first 1-2 seasons, key characteristics of funding include flexibility and local control to focus on near-term installations using low-cost contracts and procurement methods.

Short-Term funding should be:

- Flexible
- Local
- Easily combined across multiple funding sources
- Accessible as match for flexible grant programs

Goal: $150,000 to $200,000 annually for the first 3 years

Key Long-Term Funding Characteristics

In the first 3-10 years, projects should maximize coordination with programmed resurfacing and maintenance as well as prioritizing reliable and predictable local funding sources.

Long-term funding sources should be:

- Reliable
- Scalable
- Flexible

Goal: Increase annual funding amount proportional with community support and organizational capacity to $1.5 Million annually within 5 years.

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Step 2: Select and Design the Quick-Build Treatment

Integrated Capital Management (ICM) will take the lead in developing quick-build designs, either in-house or through the use of engineering contracts.

The toolbox outlines a range of quick-build treatments. This is not an exhaustive list but rather a starting point of common quick-build projects that have proven to be successful. It is important to recognize that quick-build elements can be applied in a wide variety of contexts beyond the examples presented here. Multiple treatment can also be combined into one project to achieve goals and better outcomes.

How to Use

1. **Identify your Goals:** Refer to the Design Principles and table to determine which facilities best align with your project.
2. **Choose the treatment:** Read over the facilities that align with your selected goals and identify quick-build elements that best address the identified need.
3. **Select Materials:** Check which materials are appropriate for the facility, the project type, intended duration, and budget. **Review:** Review the treatment's applications, design guidance, materials, complimentary quick-build facilities, and common constraints to verify it is appropriate for the site.
4. **Design:** Using the guidance provided in this toolbox, Spokane Standard Drawings, and the other design guidance resources provided, develop a context-sensitive design for your site.

Quick Build Toolbox

Quick-builds should be designed to meet current design guidance and standards, as appropriate, including guidance provided by the City of Spokane Design Standards, American Association of State Highway and Transportation Officials (AASHTO), Americans with Disabilities Act (ADA), the Washington State Department of Transportation (WSDOT), the Manual on Uniform Traffic Control Devices (MUTCD), Public Right-of-Way Accessibility Guidelines (PROWAG), and the National Association of City Transportation Officials (NACTO). Quick-build projects may not require a unique design approach for every location. Standard drawings are available for many of the common treatments saving time and money.

The following key design principles and summary matrix identify the primary focus areas of each quick-build treatment; however, many tools also support additional objectives depending on how and where they are applied. Refer to the individual tool descriptions for more information.

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Design Principals

Traffic Calming Focused Treatments: Goal is to create self-enforcing streets that slow speeds and reduce crash severity.

Pedestrian Focused Treatments: Goal is to reduce conflicts between pedestrians and vehicles and improve connectivity to key destinations.

Bike Focused Treatments: Goal is to reduce conflicts between cyclists and vehicles and close network gaps to improve connectivity to key destinations**.**

Placemaking Focused Treatments: Goal is to transform streets and underutilized spaces into welcoming and safer spaces for people walking and biking.

Treatment	Traffic Calming	Pedestrian Focused	Bike Focused	Placemaking
Chicane	•			
Speed Hump/Cushion	•			
Center Line Hardening/Slow Turn Wedge	•			
Mini-Roundabout	•			
Diverter	•		•	
Daylighting		•		•
Curb Extension	•	•		•
Raised Crossing	•	•		
Enhanced Crossing	•	•	•	•
Traffic Refuge Island	•	•	•	
Bike Lanes/Walking Paths		•	•	
Bike Boxes	•		•	
Bike and Micro-Mobility Parking		•	•	
In-Lane Bus Stop Improvements	•			•
Street Plaza		•		•
Parklet	•	•		•
Street Art	•			•
Cooling Corridor		•	•	•

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Chicanes



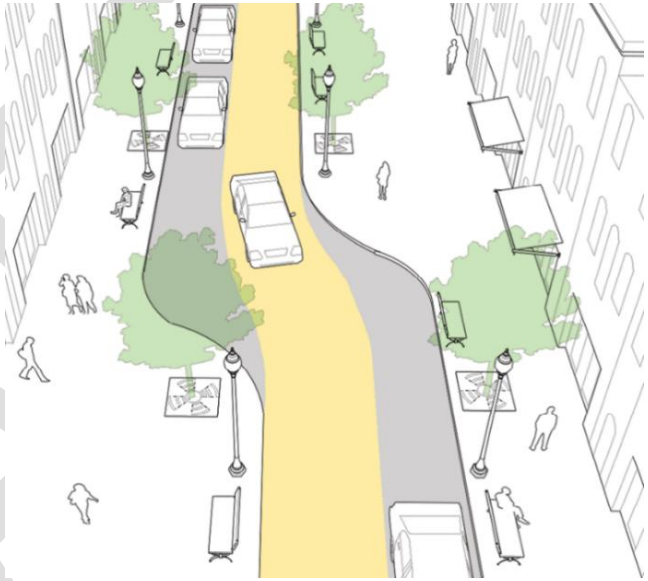
Washington Avenue Chicane, Roy Smith, CC BY-SA 4.0, via Wikimedia Commons

A chicane is traffic calming device that slows down vehicle speeds through a series of offset curb extensions, parking lanes, transit stops, or other elements within the lane that cause horizontal shifting. Due to the horizontal shifting, there is additional space in the right of way that can be better utilized with seating, street parking, bike/micro mobility parking, transit stops, and Street Art.

Applications

1- to 2-lane, one way or bi-directional, low-volume residential streets with operating speeds of 25 mph or less.

Principle: Traffic Calming



Standard Chicane Design, NACTO

Design

Required

- Use the MUTCD </= 45 mph taper to speed rate as a reference.
- Place mid-block crosswalks on portions where chicane striping is parallel to the curbline.
- Accommodate turning movements for emergency, transit, and maintenance vehicles or be traversable.

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- Provide vertical delineation for crosswalks at curbline such as flex posts or crossing signage.

Recommended

- Mark the crosswalk to the physical curb unless detectable warnings have been relocated to edge of chicane striping.
- Consider speed humps or other modular tactile roadway devices for excess roadway not being used.
- Consider ADA features such as modular ramps and detectable warning surface, If excess roadway is being used as a gathering area.

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Flex Posts
- Hay Bales
- Jersey Barrier
- Parking Stops
- Planters

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Planters
- Parking Stops
- Wave Delineators
- Jersey Barrier
- Flex Posts
- Traffic Seperators
- Speed Bumps

Additional Notes

- Consider pairing chicanes with other quick-build facilities such as Cooling Corridors, Curb Extensions, Bike and Shared Mobility Parking, and/or Street Art.
- Monitor vehicle speeds and operations after installation and adjust spacing or deflection as needed.
- Consider implementing raised crosswalks or enhanced crosswalks to increase visibility.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- May impact drainage patterns.
- May impact freight, emergency, transit, and maintenance operations and movement. May impact drainage patterns.

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Speed Hump and Speed Cushion

Speed humps and cushions are raised sections of the roadway designed to reduce vehicle speeds on local streets by creating a vertical deflection. As a result, they improve safety for all road users and discourage cut-through traffic. Speed humps are continuous elements, while speed cushions have gaps to allow emergency and larger vehicles to continue without vertical deflection.

Applications

1- to 2-lane, low-volume residential streets with operating speeds of 25 mph or less. Speed cushions are to be preferred over speed humps when on a major emergency, trucking, or maintenance route.

Principle: Traffic Calming



Speed Hump



Speed Cushion

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Design

Required

- Width to span entirety of the road leaving space for drainage near the curb.
- Place chevrons on the approaches in the direction of travel.
- Height shall not exceed **4"**
- Width shall not exceed **12'**
- Slopes shall not exceed **1:10** or be less than **1:25**
- Side Slopes on tapers should be no greater than **1:6**
- Initial vertical lip shall be no greater than **1/4** inch
- Shall be placed no more than **500'** apart
- Two **3'** gaps in speed cushions to allow for emergencies, maintenance, or larger vehicles to pass without vertical deflection.
- Appropriate MUTCD W17-1 warning signage **100'** in advance of vertical deflection
- Shall not be placed in front of driveways.

Recommendation

- Place **150 to 200 feet** apart.
- Should consider drainage, utilities, and emergency operations when placing speed humps or cushions.
- Pair with raised crossings when applicable, as the vertical deflection counts towards the recommended and required offsets of **150-500 feet**.

Materials

Pilot

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Speed Hump/Cushion
- Signage

Common Constraints

- Driveway and access constraints that limit placement options.
- Potential vehicle acceleration between devices when spacing is too far apart.
- Not typically appropriate on major arterials or key emergency response routes.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- May impact freight, emergency, transit, and maintenance operations and movement.
- May impact drainage patterns.
- Severe damage to asphalt when removed. These are not a recommended solution.

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Center Line Hardening and Slower Turn Wedges

Center Line Hardening and Slower Turn Wedges use pavement demarcations and vertical delineators to tighten turning paths at intersections and discourage drivers from accelerating and cutting around corners. By requiring slower, more deliberate turns, these treatments reduce turning speeds and keep vehicles within their intended travel path.

Applications

Intersections with significant pedestrian activity or where vehicles turning frequently create safety concerns.

Principle: Traffic Calming



Center Line Hardening



Slower Turn Wedges

Design

Required

- Accommodate turning movements (or be traversable) for emergency, transit, and maintenance vehicles.
- Delineation and demarcations shall encroach no further than adjacent travel lane minimums.
- Shall not obstruct ADA access, drainage, utilities, or emergency operations.
- Slow-turn wedge radii shall be based on the width from parallel and the perpendicular streets, parking lane, or minimum travel lane width, extending no further.
- Rubber speed bumps shall be the only vertical delineation in front of cross walk.
- Space vertical delineators, approximately 3 feet apart, where applicable.

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Recommendation

- Use the most robust vertical delineation, when feasible.
- Incorporate Street Art within slow-turn wedges.
- Continue crosswalk markings to the curb unless detectable warnings are relocated to the edge of the Slower Turn Wedge.
- Consider drainage, utilities, and emergency operations when placing.

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Sandbags
- Hay Bales
- Flex Posts
- Parking Stops
- Jersey Barrier
- Planters

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Separators
- Flex Posts
- Parking Stops
- Planters
- Speed Bumps
- Detectable Warning Surface

Additional Notes

- Consider monitoring turning movements after installation and adjust delineation placement as needed to balance speed reduction and access.
- Consider pairing with other adaptive design elements such as Traffic Refuge Islands, Curb Extensions, and/or Street Art.
- Consider vertical elements type and placement where snow removal, street sweeping, or emergency operations may be affected.
- Use high-visibility demarcation to improve driver compliance and reinforce the desired turning path.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- May impact drainage patterns.
- May impact freight, emergency, transit, and maintenance operations and movement.

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AGENDA

Traffic Circle

Traffic Circles, are compact circular intersection treatments installed at unsignalized intersections to slow vehicle speeds, improve safety, and maintain traffic flow. Quick-build traffic Circles can be created using pavement markings, flexible delineators, temporary curb elements, or small modular elements. They also provide opportunities for landscaping, public art, and beautification.

Application

Unsignalized neighborhood and local street intersections. They are particularly effective at intersections with a history of speeding, cut-through traffic, or operational concerns.

Principle: Traffic Calming

Design

Required:

- Include a clearly defined central island.
- Provide adequate signage to communicate road geometry and counterclockwise movement.
- Accommodate turning movements, or be traversable, for emergency, transit, and maintenance vehicles.
- Maintain adequate sight distances for all road users; central island shall not obstruct sight distance.
- Maintain minimum of 15 feet from center island to curb edge.

Recommendation:

- Incorporate curb extensions, bump-outs, or splitter islands to provide approach deflection and encourage lower entry speeds.
- Fill the center with hot mix asphalt.



Temporary 3-way roundabout, Richard Drdul, CC BY-SA 2.0, via Wikimedia Commons

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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Hay Bales
- Sandbags
- Flex Posts
- Parking Stops
- Jersey Barrier
- Planters
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Separators
- Flex Posts
- Parking Stops
- Planters
- Detectable Warning Surface
- Signage
- Modular Roundabout Island

Additional Notes

- Consider drainage, utilities, and emergency operations when placing.
- Consider pairing mini-roundabouts with quick-build elements such as Curb Extensions, Bike and Walking Paths, and/or enhanced Crossings.
- Consider including landscaping, planters, or public art within the central island where visibility and maintenance needs can be maintained.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- May impact freight, emergency, transit, and maintenance operations and movement.
- May impact drainage patterns.

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AGENDA

Diverter

A traffic calming tool that restricts certain vehicle movements to reduce through traffic on a street while maintaining access for people walking, biking, and emergency services. **Full (or standard) diverters** block one travel lane, forcing right turns, while allowing through traffic to the other. **Diagonal diverters** fully block through traffic for all lanes, creating. Both diverters allow for full travel for bicyclists and pedestrians. Diverters help reduce traffic volumes and speeds, discourage cut-through driving, and improve safety and comfort on neighborhood streets.

Application

Diverters are most appropriate on one or two-way streets were reducing vehicle volumes and reinforcing bicycle crossings is desired. They are especially effective along corridors with in-lane bicycle facilities or designated bikeways, helping create lower-stress conditions for bicyclists.

Principles: Traffic Calming, Bike Focused

Design

Required

- Place MUTCD compliant reduced speed signs 200 to 300 feet in advance of intersection.
- Provide MUTCD compliant DO NOT ENTER (R3-1, R3-2, or R3-27) and EXCEPT BICYCLES (MUTCD R3-7bP) signs at intersection or within diverter.
- Design turning radius to allow for emergency, maintenance, and transit vehicle access.
- Provide clear, vertical delineation, such as parking stops, heavy planters, or jersey barriers within the intersection that communicate road geometry.
- Refuge areas for cyclists within the diverter area shall be a minimum of 6 feet long and 5 feet wide

Recommendation

- Provide pavement demarcations to reinforce travel geometry and road function.



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Materials

Pop-up

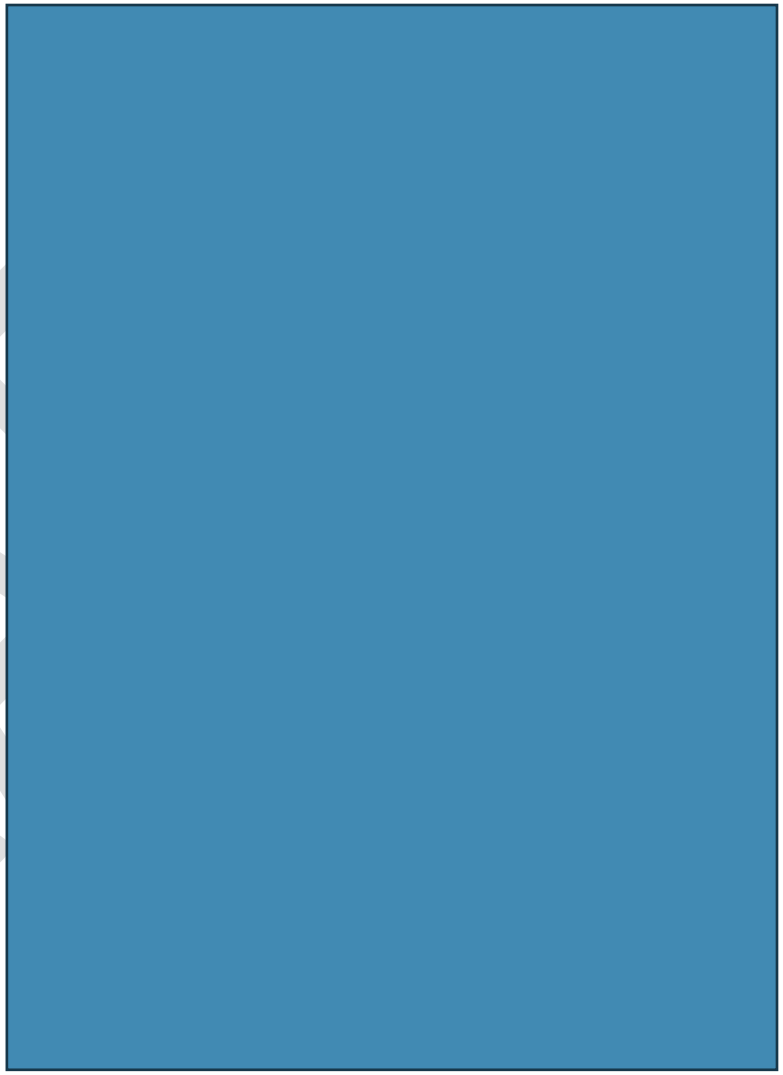
- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Hay Bales
- Sandbags
- Flex Posts
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Parking Stops
- Jersey Barrier
- Planters
- Signage

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- Heavily impacts freight, emergency, transit, and maintenance operations and movement.



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Daylighting

Daylighting is a visibility improvement treatment that removes or restricts parking and other obstructions near intersections and crossings to create clear sight lines between drivers and pedestrians. By opening space near the curb, daylighting helps users see and react to one another sooner, improves safety at crossing locations, and can reduce pedestrian crossing distances.

Applications

Intersections, driveways, and midblock crossings where parked vehicles, landscaping, or other obstructions limit visibility between pedestrians and drivers. It is particularly effective at locations with high pedestrian activity, frequent turning movements, or documented sight-distance concerns.

Principle: Pedestrian Focused, Placemaking

Design

Required

- Remove or restrict parking and other visual obstructions within a minimum of **20 feet** of the crossing, or 1 parking spot.
- Vertical elements or objects over approximately **24 inches** that obstruct visibility shall not be within the daylighting area.
- Shall not obstruct ADA access, drainage, utilities, or emergency operations.
- Use white or yellow paint to demarcate daylighting zone.
- Shall extend no further than perpendicular street crosswalk or future crosswalk width.

Recommendation

- Add vertical delineators to define daylighting area.
- Consider alternative safety measures before removing vertical elements over **24 inches** within the daylighting area such as trees and utility poles.
- Consider Street Art within daylighting zone to clearly communicate its purpose.
- Post "No Parking" signs at or in advance of Daylighting zones.
- Make the space multifunctional by including bicycle parking or Shared Mobility parking when near businesses or high activity areas.



Daylighting

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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Hay Bales
- Sandbags
- Traffic Cones/Barrels
- Flex Posts
- Parking Stops
- Planters
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Separators
- Flex Posts
- Wave Delineators
- Parking Stops
- Planters
- Signage

Additional Notes

- Consider pairing with quick build design elements such as Curb extensions, Street Art, and/or Bike and Shared Mobility Parking.

Common Constraints

- Limited roadway width and available right-of-way.
- High parking demand and loss of curbside parking.
- Existing trees, signs, and street furnishings that affect visibility, potentially requiring removal.
- Snow removal, street sweeping, and roadway maintenance conflicts. (Only if additional elements are added within Daylighting zone.)
- Potential conflicts with parking, loading zones, transit operations, and driveway access.

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AGENDA

Curb Extensions

Curb extensions, also known as bump-outs, extend the pedestrian area into the parking lane or roadway, at intersections and crossings. By narrowing the roadway and shortening crossing distances, curb extensions improve pedestrian visibility, reduce the time pedestrians spend in the street, and encourage slower vehicle speeds.

Applications

1- to 4-lane roadways where lane widths allow the curb line to be extended into the roadway. They are commonly used at intersections with wide turning radii, long pedestrian crossings, or along corridors with bicycle facilities. Alternatively, they can be applied mid-block to narrow the road (for example to create a Chicane).

Principles: Traffic Calming, Pedestrian Focused, Placemaking



Curb Extension, Seattle Right-of-Way Improvements Manual

Design

Required

- Provide ADA access.
- Shall not obstruct drainage, utilities, or emergency operations.
- Accommodate turning movements, or be traversable, for emergency, transit, and maintenance vehicles.
- Provide minimum lane widths per SSD.
- Minimum ingress length shall extend past the stop bar when at a stop controlled intersection.
- Provide clear vertical delineation communicating curb extension.
- Maintain adequate sight distances/lines for all road users.

Recommendation

- Route bicycle facilities around the curb extension or through the extension depending on available width.
- Provide clear bicycle and pedestrian delineation within curb extension.
- Include high-visibility vertical delineation and Street Art.
- Provide most robust vertical protection where the curb extension is intended for seating, gathering, or extended pedestrian use.
- Continue to mark the crosswalk to the physical curb unless detectable warnings have been relocated to the edge of the curb extension.

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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tapei
- Spray Chalk
- Spray Paint
- Hay Bales
- Sandbags
- Traffic Cones/Barrels
- Flex Posts
- Parking Stops
- Jersey Barrier
- Planters

Pilot

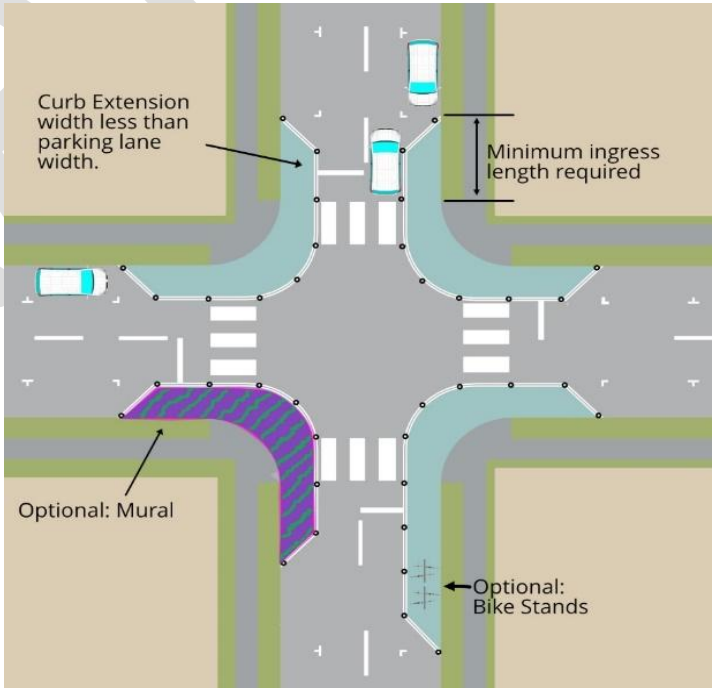
- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Seperators
- Flex Posts
- Wave Delineators
- Parking Stops
- Planters
- Moveable street furniture
- Detectable Warning Surface
- Shade (Pop-up Tent, Umbrellas, etc.)Bike Racks

Additional Notes

- Consider pairingwith quick build design elements such as raised and enhanced crossings, chicanes, mini-roundabouts, bike and shared mobility parking, and/or traffic refuge islands.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- May negatively influence freight, emergency, transit, and maintenance operations and movement.



Crossing Width Reduction Example

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Raised Crossings

Raised crossings improve visibility, accessibility, and safety by elevating the crossing to sidewalk level, making pedestrians more visible and eliminating curb transitions. Quick-build versions use modular materials for fast, cost-effective installation while helping slow vehicle speeds, increase driver awareness, and strengthen walking, rolling, and biking connections.



Raised crossing

Applications

Locations with high pedestrian and vehicle volumes, or where enhanced traffic calming, pedestrian visibility, and crossing accessibility are desired. They are also well suited for corridors that already include speed humps, as both treatments use vertical deflection to reduce vehicle speeds and reinforce driver awareness. They can be applied at uncontrolled intersections or mid-block.

Principle: Traffic Calming, Pedestrian Focused

Design

Required

- Length shall take up entirety of the road
- Shall not be placed in front of driveways, fire hydrants, utility poles, trees, or other vertical elements.
- Width shall be determined by standard crossing width (usually **10 feet**) and height shall not exceed sidewalk level.
- Slopes shall not exceed **1:10** or be less than **1:25**.
- Have chevrons on the approaches in the direction of travel.
- Provide curb-level ADA access with a maximum **¼ inch** vertical deflection and a **½ inch** gap between raised intersection and sidewalk.
- Appropriate MUTCD W17-1 warning signage **100'** in advance of vertical deflection
- Include detectable warning surfaces at crossing edges.

Recommendation

- Avoid skewed crossings when feasible.
- Include pedestrian crossing warning signs, especially at mid-block locations.
- Should be level with the adjacent curbs where no ADA ramp is present.

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Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Detectable Warning Surface
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Detectable Warning Surface
- Modular Raised Crossing
- Modular ADA Ramps
- Signage

Additional Notes

- Consider pairing raised crossings with speed humps or cushions. (Max distance **500 feet**, desired **150 to 200 feet** apart)
- Consider whether a stop bar is needed at stop controlled intersection, if so refer to *SSD*.
- Alternative anchoring options should be explored.

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Art Crosswalks

Art Crosswalks use high-visibility pavement markings, colored surface treatments, or other painted features to make pedestrian crossing locations more noticeable to both drivers and pedestrians. These treatments improve crossing visibility, reinforce pedestrian priority, and can help increase driver yielding behavior

Application

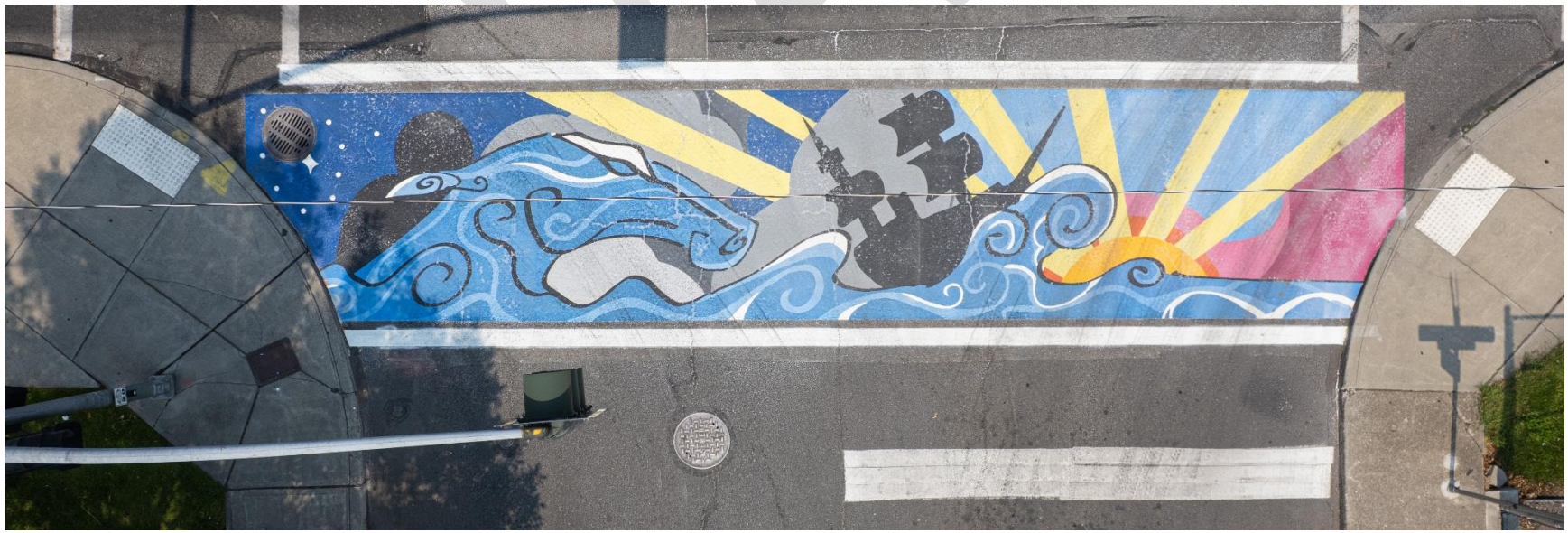
Art Crosswalks are best suited for high-volume pedestrian areas where greater visibility and driver awareness are needed, such as near schools, parks, transit stops, hospitals, and libraries. They can be installed at intersections or midblock locations and may also support placemaking and community-led improvements.

Principles: Traffic Calming, Pedestrian Focused, Placemaking

Design

Required

- Must use the Transverse Crosswalk Layout as detailed in SSD G-51.
- The exterior boundary shall be **8 inches** thick and white.
- There must be a 6 inch separation between the white crosswalk line and the artwork.
- If at a stop-controlled intersection, Shall have a **2 feet** wide stop bar located 4 feet back from crossing.
- Crossing width must be 10 **feet**.
- Include detectable warning surfaces at crossing edges.
- Crosswalk demarcations shall not extend further than the adjacent curbline.



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- Placed between 2 ADA access points, through a combination of existing curb cuts and modular ramps.
- Artwork shall remain within the approved crosswalk demarcations and not obscure or overlap with pavement markings, curbs, or other traffic control features.
- Designs shall not resemble or interfere with MUTCD traffic control devices, markings, or messages.
- Select colors and patterns that are visually engaging while maintaining contrast with roadway markings.
- Artwork shall not include text, numbers, logos, advertisements, or directional messages.

Recommendation

- Shorten pedestrian crossing distances, where feasible, through other quick-build designs such as Curb Extensions and/or Traffic Islands
- Continue to mark the crosswalk to the curb unless detectable warnings have been relocated to the edge of alternative element.
- Use simple, cohesive patterns that are easy to recognize at roadway scale.
- Incorporate neighborhood identity, culture, or community character.

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic

Additional Notes

- Clean or power wash the pavement surface before installation, taking care not to damage existing roadway markings.
- Consider installing artwork after resurfacing projects whenever possible.
- Consider engaging local artists, businesses, and community groups during design development.

Common Constraints

- Artwork is subject to weathering, snow removal, and routine roadway maintenance, requiring periodic touch-ups or replacement.
- Pavement conditions may limit installation; deteriorated surfaces often require repair or resurfacing before artwork is applied.

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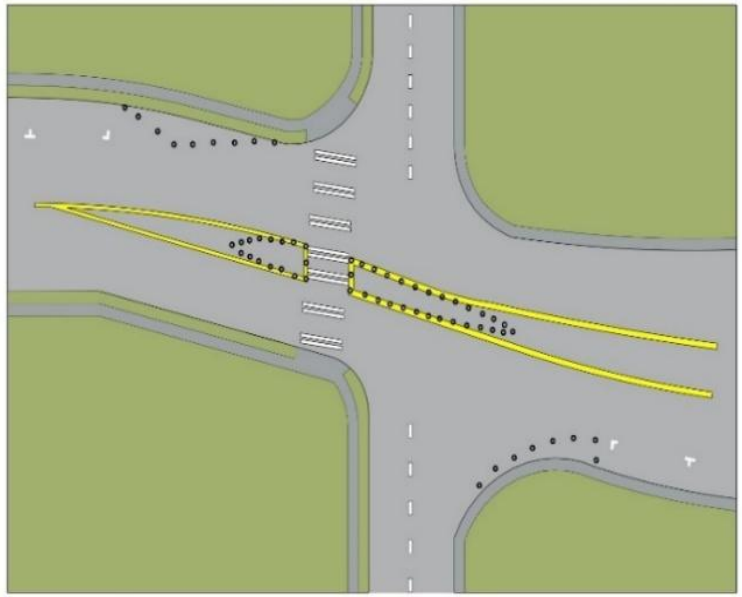
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Traffic Refuge Island

Traffic refuge islands are protected spaces within the roadway that allow pedestrians and/or bicyclists to cross one direction of traffic at a time. They improve safety and comfort by reducing crossing distances and increasing driver awareness of crossing activity.

Application

Typically used on roadways with three or more lanes (and sometimes two-lane streets with sufficient width), refuge islands can be installed at intersections or midblock crossings. They are most effective at major pedestrian and bicyclist crossings, long or difficult crossings, higher-speed or higher-volume corridors, locations with limited crossing opportunities, and near schools, parks, trails, transit stops, commercial centers, and other key destinations.



Intersection Diverter Example

Principles: Traffic Calming, Pedestrian Focused, Bike Focused

Design

Required

- Absolute minimum landing area length of **4 feet**; use minimum of **6 feet** when roadway widths allow or if providing refuge for bicyclists.
- Install Right Turn Only (MUTCD R3-5R) Signs and appropriate crosswalk signage or similar signs.
- A landing area gap as wide as the crosswalk and/or bicycle crossing.
- Provide a 'nose' on either side of the landing area; the nose shall have vertical delineation with a minimum radius of **2 feet**.
- Accommodate turning movements for emergency, transit, and maintenance vehicles.

Recommendation

- Use detectable warning surfaces on the edge of refuge island.
- Should be **8 to10 feet** long when roadway widths allow.
- Island demarcation should be **40 feet** long, especially along high speed and volume roads.
- Provide most robust vertical protection at traffic islands.
- Use Street Art or demarcations to delineate landing area from roadway.

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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Flex Posts
- Parking Stops
- Jersey Barriers
- Planters
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Separators
- Flex Posts
- Parking Stops
- Planters
- Detectable Warning Surfaces
- Signage

Additional Notes:

- Consider pairing with quick-build design elements such as Street Art and Curb Extensions.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- May impact freight, emergency, transit, and maintenance operations and movement
- May impact drainage patterns and utility access.



Pedestrian Refuge Design, Seattle Right-of-Way Improvements Manual

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AGENDA

Buffered or Separated Bike Lanes and Walking Paths

These include bike lanes, shared-use paths, and alternative pedestrian walkways that are located within the existing roadway. **Buffered paths** use pavement markings to create separation from vehicle traffic, while **separated paths** provide a greater level of comfort and safety through physical separation with vertical delineators. Facilities may be one-way, two-way, or contraflow depending on the roadway context and goals.

Application

Can be implemented on most roadway types where sufficient width is available to accommodate dedicated space for walking, bicycling, or rolling. These facilities are commonly used to close network gaps, improve safety and comfort, and provide accessible routes as interim or in lieu of larger capital investments. They should be prioritized on streets with inadequate infrastructure.

Principles: Pedestrian Focused, Bike Focused

Design

The design and dimensions of these paths vary based on the facility type, desired level of separation, and roadway speed and geometry.

The following resources provide guidance for selecting and designing appropriate facilities, including Bike Lanes, Shared-Use Paths, and Pedestrian Walkways.

Pedestrian Walkways

- Portland Pedestrian Design Guide: B.5.4
- PROWAG: Chapter 3 Technical Requirements

Bike Lanes

- Spokane Bicycle Design Guide
- NACTO: Urban Bikeway Design Guide

Shared-Use Path

- WSDOT Design Manual, Ch. 1515 M22-01.23
- Portland Pedestrian Design Guide: B.5.4



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AGENDA

Materials:

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Flex Posts
- Parking Stops
- Jersey Barriers
- Planters
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Separators
- Flex Posts
- Wave Delineators
- Parking Stops
- Jersey Barrier
- Planters
- Detectable Warning Surface
- Signage

Additional Notes:

- Coordinate with existing and planned bicycles, pedestrians, and transit networks.
- Consider pairing with adaptive design elements such as Street Plazas, Bike and Shared Mobility Parking, Raised and Enhanced Crossings, Mini Roundabouts, Chicanes, and/or Traffic Refuge Islands.

Common Constraints:

- Limited roadway width and right-of-way availability.
- Conflicts with parking, loading zones, transit operations, and driveway access.
- Drainage, utility, and emergency operations placement conflicts.
- Snow removal, street sweeping, and roadway maintenance conflicts.



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AGENDA

Bike Boxes

Bike boxes and two-stage queue boxes are intersection treatments that provide dedicated space for people bicycling at signalized intersections. A bike box is a marked waiting area positioned ahead of stopped vehicles at a red light, allowing bicyclists to be more visible, access the intersection ahead of vehicle queues, and reduce conflicts with turning vehicles. Two-stage turn boxes provide a designated area for bicyclists to wait and complete turns in two movements, offering a safer and more comfortable alternative to merging across multiple traffic lanes.

Application:

Signalized intersections with designated bicycle facilities, particularly where right-turning vehicle movements create conflicts with bicyclists. Two-stage turn boxes are typically applied at signalized, multilane, high-volume, or higher-speed intersections where bicyclists would otherwise need to merge across multiple traffic lanes to complete a turn. Both treatments are well suited for locations with significant bicycle activity, along buffered or separated bicycle facilities and at crossings of complex intersections.

Principles: Traffic Calming, Bike Focused

Design

Required

- See City of Spokane Design Criteria Manual for dimensions.
- Minimum **50 feet** lane approach the bicycle box.
- Provide green-colored pavement demarcation within the entire extent of the bike box and within the approach lane for a minimum of **20 feet** upstream.
- Install a No Turn on Red Sign (MUTCD R10-11) or similar sign on approaches where traffic may turn right through the bike box on a red signal.
- Two-stage queue boxes should be a minimum of 6.5 feet long in the direction bicyclists are expected to depart the box.

Recommendation

- For pop-up projects longer than a week, use spray paint or acrylic traffic paint as bike boxes are in high traffic areas.
- Provide a white bicyclist demarcation symbol within the bike box.

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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic





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Bike and Shared-Mobility Parking/Corrals

Bicycle and Shared Mobility Parking provide dedicated spaces to store bicycles, e-bikes, scooters, and other mobility devices. Facilities may include sidewalk racks, on-street corrals, and parking hubs located near destinations, transit stops, and activity centers.

Application

Commonly used in downtown, commercial districts, near transit, schools, parks, and other high-demand destinations. Facilities may be located on sidewalks, plazas, or within the roadway. Short-term parking is typically provided through on street or sidewalk racks/corrals. Long-term parking may include secure, access-controlled facilities near transit stations and major employment centers. **Go By Bike** in Portland, OR is a notable example of a quick-build design, staffed, long-term, and free to use bicycle parking corral.

Principles: Pedestrian Focused, Bike Focused

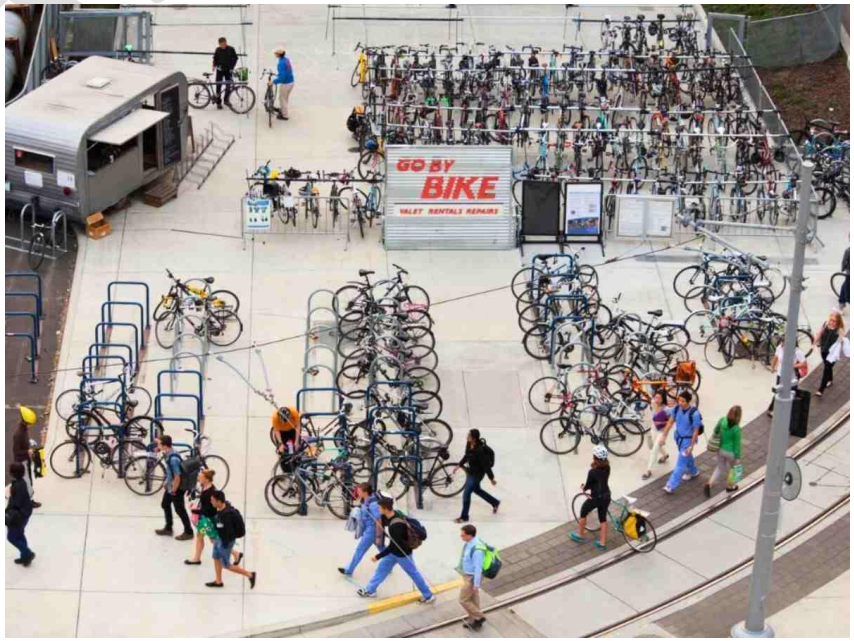
Design:

Required

- In-street corrals shall take up no more than 2 parking spots (about **40 feet**)
- When in roadway, corrals shall be clearly vertically delineated, paint demarcated and provide minimum lane widths per SSD.
- Maintain clear pedestrian access and not create obstructions or tripping hazards within the pedestrian walkway.
- Shall not obstruct ADA access, drainage, utilities, or emergency operations.

Recommendation

- Use bicycle racks that support standard U-lock and provide at least two points of contact with the bicycle.
- Provide adequate spacing between racks (minimum **15 inches** between adjacent U-racks).
- Provide weather protection, lighting, or security. features where long-term parking is provided.
- Provide most robust vertical protection when in the roadway.



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AGENDA

Materials

Pop-Up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Traffic Cones/Barrels
- Flex Posts
- Parking Stops
- Jersey Barriers
- Planters
- Fencing
- Bike Racks
- Shade (pop-up tent, umbrellas, etc.)

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Traffic Separators
- Flex Posts
- Wave Delineators
- Parking Stops
- Jersey Barriers
- Planters
- Fences
- Bike Racks
- Shade (Shade Sails, Pergolas)

Structural Materials

- Wood
- Plastic
- Metal
- Concrete

Additional Notes

- Consider future demand and flexibility when selecting locations and sizing facilities, as bicycle and shared-mobility parking demand can grow quickly once safe riding infrastructure is added.
- Consider pairing with quick build design elements such as Curb Extensions, Daylighting, Chicanes, Street Plazas, and Cooling Corridors.
- Consider coordinating with micro and shared-mobility companies such as Lime.
- Consider coordinating with large employers and destinations for long-term parking.

Common Constraints

- Limited roadway width and available right-of-way
- Snow removal, street sweeping, and roadway maintenance conflicts.
- Maintenance, security, and parking management needs.
- Potential conflicts with parking, loading zones, transit operations, and driveway access

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AGENDA

Modular Bus Platforms

Modular bus platforms improve transit access and operations by extending the bus boarding platform into the lane, allowing buses to stop without leaving the travel lane. These treatments can reduce delays associated with merging back into traffic, improve transit reliability, and support safer integration between transit, walking, bicycling, and other modes.

Floating bus stops can further reduce conflicts between buses and bicyclists by routing bicycle traffic behind the stations. Additionally, general improvements can be made for bus stops lacking basic infrastructure through shelters, seating, and placemaking elements.

Application

Bus stops located along bicycle facilities, corridors with on-street parking, or locations where improving transit reliability and reducing bus merging movements are desired. They are also well suited for stops that lack basic passenger amenities, allowing shelters, seating, boarding platforms, and accessibility improvements to be added.

Principles: Traffic Calming, Placemaking

Design:

Required

- Provide a minimum accessible ADA boarding area of **8 feet by 5 feet** (includes bike lane width minimum for floating bus stops)
- Maintain a minimum **4 foot** bicycle facility width where a bike lane passes behind a floating bus stop.
- Include pavement markings, signage, or other treatments that clearly define pedestrian and bicycle movements at floating bus stops.
- Provide Detectable warning surfaces at platform and curb edges.
- Improvements shall not obstruct ADA travel paths or boarding operations.
- Follow all other design elements stated in the SSD and STA standard designs.
- Shall not obstruct ADA access, drainage, utilities, or emergency operations.
- Maximum **¼ inch** vertical deflection and **½ inch** gap from curb

Recommendation

- Provide seating, shade, and/or shelter at bus stops that lack these elements.
- Route bike lane around the front of the bus stop, with proper demarcated buffer, when there is roadway width to do so.

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AGENDA

Materials

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Flex Posts
- Traffic Separators
- Wave Delineators
- Planters
- Moveable Street Furniture
- Detectable Warning Surfaces
- Shade (Pop-up tent, umbrellas, pergolas, etc.)
- Modular Bus Stop
- Modular ADA Ramps
- Signage

Structural Materials

- Wood
- Plastic
- Metal
- Concrete

Additional Notes:

- Coordinate with STA before planning and implementation.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- Potential conflicts with trasnit riders, pedestrians, and bicylists depending on orientation.



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Street Plaza

A Street Plaza is a conversion of the public right of way into a people-oriented community space typically one block in length. Street plazas repurpose the roadway to create places for gathering dining, recreation, events, and neighborhood activation.

Applications

Low-volume streets in downtowns, business districts, and mixed-use areas with strong pedestrian activity. They are especially effective where excess roadway space, slip lanes, underutilized street segments can be repurposed.

Principles: Pedestrian Focused, Placemaking



Design

Required:

- Maintain emergency and local residential/business access unless extensive public involvement has been held.
- Provide ADA-compliant pedestrian routes.
- Restrict to a minimum **13.5 foot** travel lane (½ minimum street width per SSD).
- If one lane is restricted, shall dedicate the full lane width to plaza.
- Clearly define entrances with signage, vertical delineation, detectable warning surfaces, demarcation, or Street Art.

Recommendation:

- Provide seating, regular programming, and shade elements.
- Restrict to one block in length. If spanning more than one block, either close through traffic or use additional adaptive design elements such as Curb Extensions, Street Art, Traffic Refuge Islands, and Raised Crossings.

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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint
- Hay Bales
- Traffic Cones/Barrels
- Flex Posts
- Parking Stop
- Jersey Barrier
- Type lll Barricade
- Planters
- Shade (pop-up tent, umbrellas, etc.)
- Moveable street furniture
- Signage

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic
- Flex posts
- Wave Delineator
- Parking Stop
- Planter
- Moveable street furniture
- Modular ADA Ramps
- Detectable Warning Surface
- Shade (Shade Sails, Pergolas)
- Signage
- Cooling: (Misting Tubes, Industrial Fans)

Structural Materials

- Wood
- Plastic
- Metal
- Concrete

Additional Notes

- Best implemented temporarily, seasonally, or as a pilot before permanent construction.
- Consider programming, events, dining, public art, and markets to increase activity and support local businesses.
- Consider maintaining bicycle access where feasible and provide clear bicycle and pedestrian delineation within the Street Plaza.
- Consider pairing with quick-build design elements such as Parklets, Curb Extensions, Cooling Corridors, and Street Art.

Common Constraints

- Impacts to traffic circulation, loading, and parking.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- Coordination with adjacent businesses and residents.
- May negatively influence freight, emergency, transit, and maintenance operations and movement.

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AGENDA

Parklets

Parklets provide public or private community space by converting parking spaces into public seating areas. Parklets can take many forms either as vertically delineated areas with moveable street furniture or a covered patio. Spokane has also referred to these as “Streateries”.

Applications

Along commercial streets or neighborhood retail corridors with moderate to high pedestrian activity. Most often in front of businesses who desire outdoor seating but lack adequate outdoor space. They can alternatively be placed in parking lots.

Principles: Traffic Calming, Pedestrian Focused, Placemaking



Howard Street Parklet, Summer 2024

Design

Required

- Min Length: **20 feet** for parallel street parking and **27 feet** for perpendicular street parking.
- Minimum width: **6 feet**
- Maximum width: Width of parking lane on site.
- Have a parking stop **4 feet** from the sides of the parklet, offset **1 foot** from the curb.
- Minimum buffer between parklet and adjacent travel lane: **1 to 2 feet**
- Minimum distance from intersections/driveways: **20 feet (**presence of intersection or curb treatment may shorten this)
- Place no closer than **15 feet** from fire hydrant.
- If level with curb, provide curb-level ADA access with a maximum **¼ inch** vertical deflection and a **½ inch** gap.
- Shall not obstruct drainage, utilities, emergency access, transit stops or driveways.
- Shall be a freestanding structure, no element attached to the street or curb.
- The road shall have a grade no greater than **5%**.

Recommendation

- Integrate protective elements such as planters, railings, or other vertical separation treatments to enhance comfort and safety adjacent to travel lanes.

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AGENDA

Materials

Pop-up

- Parking Stop (required)
- Hay Bales
- Traffic Cones/Barrels
- Flex Posts
- Jersey Barrier
- Planters
- Moveable street furniture

Pilot

- Parking Stop (required)
- Traffic Separators
- Flex Posts
- Jersey Barrier
- Moveable street furniture
- Shade (Umbrellas, Pergolas, etc.)

Structural Materials:

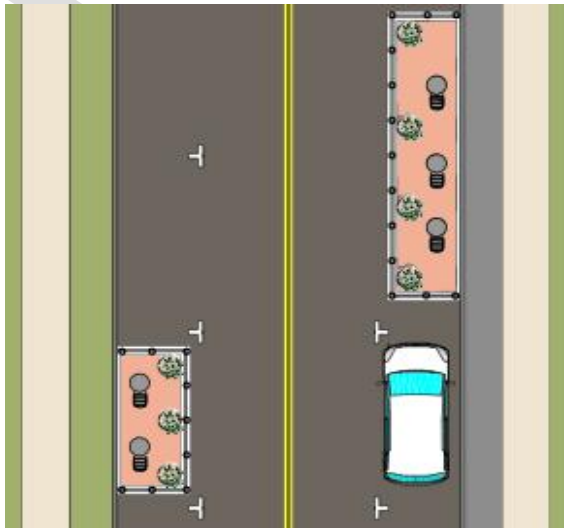
- Patio
  - Wood
  - Plastic
  - Metal
  - Concrete

Additional Notes

- Encourage stewardship by adjacent businesses or community organizations for maintenance and programming.
- Evaluate pedestrian activity, business impacts, and user feedback to inform permanent implementation.

Common Constraints

- Limited roadway width and available right-of-way.
- Snow removal, street sweeping, and roadway maintenance conflicts.
- Conflicts with parking, loading zones, transit operations, and driveway access.



Parklet Design Example

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Street Art

Street art includes a variety of creative pavement treatments that add visual interest, reinforce community character, and improve the visibility and legibility of streets for all users. As a result, street art can enhance safety by drawing attention to specific portions of the road, resulting in traffic calming. These treatments can help create a stronger sense of place while supporting safer and more comfortable walking and rolling environments. Spokane supports these efforts through its **Asphalt Art** program, which uses community-driven street murals and pavement art to enhance public spaces and roadway safety.

Applications

Street art can be incorporated into a wide range of quick-build projects, including curb extensions, art crosswalks, street plazas, daylighting treatments, and other streetscape improvements. It can be applied as a standalone street mural or combined with other safety treatments to increase their visibility and effectiveness. Street art can also be applied where the community expresses interest.

Principles: Traffic Calming, Placemaking

Design:

Required

- Artwork shall remain within the area and not obscure or overlap with pavement markings, curbs, or other traffic control features.
- Designs shall not resemble or interfere with MUTCD traffic control devices, markings, or messages.
- Select colors and patterns that are visually engaging while maintaining contrast with roadway markings.
- Artwork shall not include text, numbers, logos, advertisements, or directional messages.

Recommendation

- Use simple, cohesive patterns that are easy to recognize at roadway scale.
- Incorporate neighborhood identity, culture, or community character.



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AGENDA

Materials

Pop-up

- Sidewalk Chalk
- Cornstarch Paint
- Traffic Tape
- Spray Chalk
- Spray Paint

Pilot

- Acrylic Traffic Paint
- DLPM
- Thermoplastic

Additional Notes

- Clean or power wash the pavement surface before installation, taking care not to damage existing roadway markings.
- Consider installing artwork after resurfacing projects whenever possible.
- Consider engaging local artists, businesses, and community groups during design development.
- Consider complementary programming or events to activate the space and encourage community use.
- Develop a maintenance and removal plan, including coordination with agency partners before installation.
- Refer to Asphalt Art

Common Constraints

- Artwork is subject to weathering, snow removal, and routine roadway maintenance, requiring periodic touch-ups or replacement.
- Pavement conditions may limit installation; deteriorated surfaces often require repair or resurfacing before artwork is applied.

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Cooling Corridor

Cooling Corridors are pedestrian and cyclists' spaces and routes enhanced with shade/cooling infrastructure to improve comfort, reduce heat, and UV exposure. Cooling Corridors can be provided through tree planters, umbrellas, canopies, pergolas, and water elements such as misting tubes.

Applications

They are most effective along pedestrian routes with high sun exposure and urban heat, particularly where people walk, wait, or gather. They can be installed on sidewalks, within plazas and public parks, at or between transit stops, and near schools, parks, community centers, and commercial districts, or where there are high pedestrian and cyclist volumes. Cooling corridors can also be incorporated into other quick-build street design projects.

Principles: Pedestrian Focused, Bike Focused, Placemaking

Design

Required

- Shade structures and water elements shall maintain pedestrian accessibility and clear in lane travel paths
- Installations shall not obstruct visibility at intersections, driveways, or transit stops.
- Shade structures shall be securely weighted or fastened to withstand wind and other weather conditions.
- All shade structures shall be a freestanding structure; no element permanently attached to the street or curb
- Installation placements shall not conflict with freight, emergency, transit, and maintenance operations and movement.

Recommendation

- Sites should be based on community desire, lack of shade, and high urban heat.
- Incorporate vegetation where and when possible.
- Orient shade structures and elements to provide refuge from the sun for the longest periods of times at the hottest times of day.



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AGENDA

Materials

Pop-up

- Shade (Pop-up tent, Umbrellas, etc.)
- Cooling Elements (Misting Tubes, Industrial Fans
- Moveable street furniture
- Sandbags

Pilot

- Shade (Shade Sails, Pergolas, etc.)
- Cooling Elements (Misting Tubes, Industrial Fans)
- Moveable street furniture
- Sandbags

Structural Materials

- Pergolas
    - Sheet Metal
    - Wood
    - Plastic
    - Fabric

Additional Notes

- Consider creating a continuos network of Cooling Corridors between high pedestrain locations.
- Cooling corridors can easily be made seasonal.
- Coordinate with local business owners or community centers.

Common Constraints

- Limted space for cooling structures within constrained ROW
- Availability of water and electrical services for cooling features.



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AGENDA

Materials

This section provides guidance on recommended materials for quick-build design projects. Materials are organized into three categories:

- Demarcation
- Vertical Delineation
- Modular/Pre-Fabricated
- Additional Materials

Materials are generally presented from lowest to highest cost within each category. Each material includes guidance on its suitability for **Pop-up** and **Pilot** installations.

This organization is intended to help practitioners select materials that best align with project goals, budgets, and anticipated installation durations. When selecting materials, consider:

- Ease of Use
- Durability
- Maintenance Requirements
- Storage Requirements

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AGENDA

Demarcation Materials

Demarcation materials include surface treatments and markings used to visually define space, communicate intended use, and guide roadway users. These materials range from temporary treatments, such as sidewalk chalk and cornstarch paint, to more durable installations, including traffic paint and thermoplastic markings.

While examples of colored roadway treatments may be referenced throughout this guide, practitioners should note that colored pavement markings within the roadway may not be MUTCD-compliant and should be evaluated accordingly.

The City of Spokane's Asphalt Art Program provides guidance for artistic pavement treatments, and users are encouraged to reference that program's standards and recommendations for additional direction on decorative roadway markings.



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Sidewalk Chalk

Cost	Low
Lifespan	1-7 Days
Pop-up	Yes
Pilot	No

Sidewalk chalk is an inexpensive, removable material that works well for pop-up projects, one-day events, or community engagement activities where easy removal is desired.

- Wash road with water and let dry
- Use large "railroad" chalk sticks apply a thick layer, brush away excess dust,
- Lightly coat the finished marking with hairspray to improve durability.
- Use stencils and yard sticks for clean and legible designs.
- Remove with water and scrubbing.



Cornstarch Paint

Cost	Low
Lifespan	1-2 Weeks
Pop-up	Yes
Pilot	No

Cornstarch paint is a low-cost, biodegradable coating can use very bright pigments, making it ideal for high visibility.

- Mix equal parts cornstarch and water with powdered or liquid tempura paint.
- Heat the mixture until it reaches a smooth, paint-like consistency.
- Wash road with water and let dry
- Apply 1-3 layers with a paint roller or paint brush.
- Use stencils and yard sticks for clean and legible designs.
- Remove with water and scrubbing.



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Spray Chalk

Cost	Low
Lifespan	1-7 Days
Pop-up	Yes
Pilot	No

Spray chalk is a fast, easy-to-apply alternative to sidewalk chalk for temporary lane markings, wayfinding, and public engagement activities.

- Wash road with water and let dry.
- Lightly coat the finished marking with hairspray to improve durability.
- Use stencils and yard sticks for clean and legible designs.
- Remove with water and scrubbing.



Traffic Tape

Cost	Low
Lifespan	1-6 Months
Pop-up	Yes
Pilot	No

Traffic Tape is a durable, self-adhesive pavement marking material used for temporary striping and delineation in quick-build projects.

- Wash road with water and let dry.
- Firmly press tape onto the surface to ensure adhesion.
- Use for temporary lane lines, symbols, and other markings.
- Remove by pulling off after the project with minimal pavement impacts.



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Spray Paint

Cost	Low
Lifespan	1-6 Months
Pop-up	Yes
Pilot	No

Spray Paint provides a durable, high-visibility option for temporary pavement markings in longer pop-up projects or pop-up projects in highly traveled areas experiencing more wear.

- Clean and dry the pavement surface before application.
- Use stencils and guides for clean, consistent markings.
- Can be removed with pressure washing.
- While more durable than chalk and tape, spray paint can fade in high wear conditions, making it the most robust demarcation for Pop-up projects.

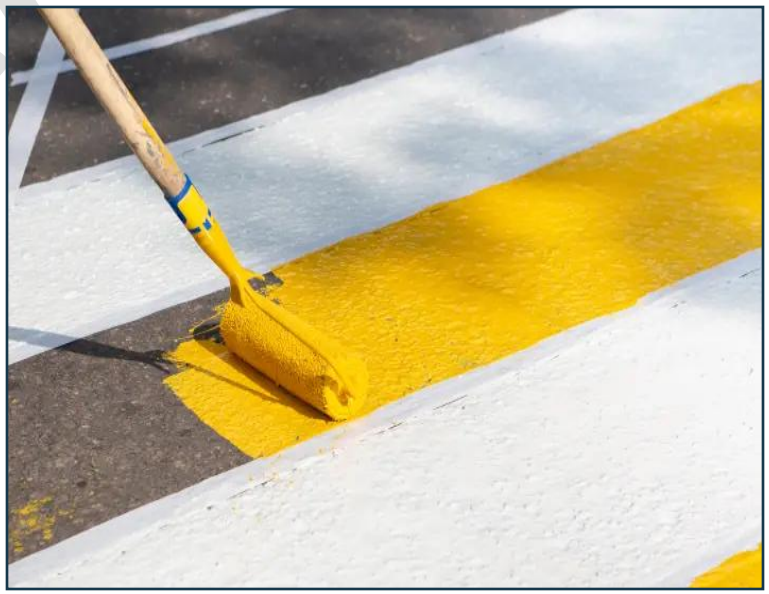


Acrylic Traffic Paint

Cost	Moderate
Lifespan	1-3 Years
Pop-up	No
Pilot	Yes

Acrylic Traffic Paint is a durable, water-based coating used for highly visible pavement markings in pilot projects.

- Clean and dry the pavement surface before application.
- Apply using rollers, brushes, stencils, or striping equipment.
- Can be removed through pressure washing or surface grinding when needed.
- Given durability and lifespan, this demarcation is best for many standard length Pilot Projects.



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Durable Liquid Pavement Markings

Cost	Moderate
Lifespan	2-8 Years
Pop-up	No
Pilot	Yes

Durable Liquid Pavement Markings (e.g., epoxy and MMA) are high-performance coatings used for long-lasting pavement markings. It provides significantly greater durability and longevity than paint, tape, or chalk and remains visible for several years. It is considered a semi-permanent treatment best suited for long-term Pilot Projects.

- Application and removal should be performed by trained professionals using specialized equipment.
- Removal generally requires grinding, shot blasting, or other abrasive methods.



Thermoplastic

Cost	High
Lifespan	5-10 Years
Pop-Up	No
Pilot	Yes

Thermoplastic is a highly durable pavement marking material used for long-lasting lines, symbols, and surface treatments in the roadway. Provides greater durability and longevity than all other demarcation options. Reflective elements can be incorporated to improve nighttime visibility. It is considered a semi-permanent treatment best suited for long-term Pilot Projects.

- Available as hot-applied material or pre-formed sheets.
- Application and removal should be performed by trained professionals using specialized equipment.



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Vertical Delineation Materials

Vertical delineation materials include devices and features used provide a physical or visual separation between different users and travel modes, to define space, channel movements, and increase visibility. These materials range from traffic cones and flexible delineator posts to more substantial elements like parking stops and modular barriers. Vertical delineation is often used in quick-build design projects to reinforce roadway reconfigurations, protect pedestrian and bicycle spaces, and communicate intended travel patterns. Material selection should consider the level of separation needed between users.



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Hay Bales

Cost	Low
Lifespan	1-3 Days
Pop-up	Yes
Pilot	No

Hay Bales are low-cost materials used to define space, provide seating, and create a temporary sense of enclosure. Best used for pop-ups.

- Can be used as-is or painted to improve visibility.
- Deteriorates when exposed to weather and is best suited for weekend Pop-up projects.
- Should be removed or replaced with more permanent materials following a pilot project.



Sandbags

Cost	Low
Lifespan	3-9 Months
Pop-up	Yes
Pilot	No

Sandbags are versatile temporary materials used for low-profile delineation and to stabilize other quick-build elements. Best suited for Pop-up Projects unless supporting other elements.

- Can be used as-is or painted to improve visibility.
- Can be used for temporary delineation in areas that must remain traversable.
- Commonly used to secure cones, signs, flex posts, shade structures, and other materials.



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Traffic Cones/Barrels

Cost	Low
Lifespan	1-10 Years
Pop-up	Yes
Pilot	No

Traffic Cones and Barrels are portable traffic control devices used to define space, guide traffic, and provide highly visible vertical delineation.

- Cones are lightweight, inexpensive, and easy to reposition as project needs change.
- Barrels provide greater visibility and stability, particularly in higher-speed environments.
- Useful for defining travel lanes, activity areas, and temporary traffic patterns.



Flex Posts

Cost	Low-Moderate
Lifespan	1-10 Years
Pop-up	Yes
Pilot	Yes

Flex Posts are versatile vertical delineators available in a variety of sizes, colors, and durability levels. Useful for defining space, discouraging vehicle encroachment, and improving user comfort.

- Available in multiple heights, diameters, and visibility options to suit different applications.
- Can be installed using bases, adhesives, bolt-down mounts, or modular curb systems.
- Select post type, mounting method, and spacing based on purpose, project duration, visibility needs, and desired level of separation.



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Parking Stop

Cost	Moderate
Lifespan	5-20 Years
Pop-up	Yes
Pilot	Yes

Parking Stops are low-profile barriers used to define edges, discourage vehicle encroachment, and reinforce the boundaries of quick-build installations. They are more substantial and less traversable than traffic separators.

- Typically made of rubber, concrete, or recycled materials.
- Can be installed with bolts or adhesive butyl pads.



Type III Barricade

Cost	Moderate
Lifespan	5-15 Years
Pop-up	Yes
Pilot	Yes

Type III Barricades are highly visible traffic control devices used to restrict vehicle access and define temporary closures. They are commonly used to close streets, block travel lanes, manage access during demonstrations, and creating separated pedestrian, bicycle, or community spaces.

- Highly visible, portable, and easy to deploy or relocate as project needs change.
- Can serve as a longer-term treatment when securely mounted and paired with other delineation elements.



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Wave Delineator

Cost	Moderate
Lifespan	3-10 Years
Pop-up	Possibly (see below)
Pilot	Yes

Wave Delineators are modular, interlocking panels used to channelize traffic and create continuous visual separation for protected spaces.

- Create a highly visible barrier for lane delineation and protected facilities.
- Interlocking design allows for easy storage, transport, and reconfiguration.
- Can be temporarily installed using butyl pads for Pop-up projects or bolted down for pilots.
- Provides more vertical separation than other modular materials.



Traffic Separator

Cost	Moderate
Lifespan	5-15 Years
Pop-up	Possibly (see below)
Pilot	Yes

Traffic Separators are low-profile, modular barriers used to provide visual and physical separation while remaining traversable for vehicles when necessary.

- Can be arranged and spaced to meet a variety of design objectives.
- Can be temporarily installed using butyl pads or bolted down.
- Traversable design allows emergency and maintenance vehicle access when needed.



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Planters

Cost	low-High
Lifespan	1-20 Years
Pop-up	Yes
Pilot	Yes

Planters are used to create separation between vehicle, bicycle, and pedestrian spaces, to define space, and enhance the appearance of quick-build projects.

- Available in a variety of materials, including plastic, fiberglass, steel, and concrete.
- Lighter planters are well suited for demonstrations, while heavier planters support longer-term installations.



Jersey Barrier

Cost	Moderate-High
Lifespan	5-20 Years
Pop-up	Yes
Pilot	Yes

Jersey Barriers are modular barriers used to provide strong physical separation between vehicle, bicycle, and pedestrian spaces and for channelization.

- Available in plastic (water- or sand-filled) and concrete forms.
- Concrete barriers are better suited for longer-term installations and higher-speed environments.
- Can be linked together to create continuous separation and channelization.

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Modular and Pre-Fabricated Materials

Modular and pre-fabricated materials are larger, pre-manufactured elements used to create durable quick-build roadway features with minimal on-site construction. While some modular elements are also used for vertical delineation and other quick-build treatments, this category is generally reserved for larger, more substantial products that offer greater durability but may be less customizable than site-built solutions. These include speed bumps, humps and cushions, ADA ramps, mini-roundabouts, bus stops, and raised street crossings. These elements can be removed or relocated as project layouts evolve.

Material selection should consider the desired function, level of protection, maintenance and storage needs, and long-term project goals. Product costs and installation requirements vary significantly by manufacturer and application.



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Modular Speed Bumps

Cost	Moderate
Lifespan	5-15 Years
Pop-up	Possibly (see below)
Pilot	Yes

Modular Rubber Speed Bumps are traffic calming elements used reduce speeds and reinforce quick-build roadway treatments.

- Can be installed with minimal roadway modifications.
- Typically anchored directly to the pavement using bolts or similar fastening systems.



Modular Speed Humps and Cushions

Cost	Moderate-High
Lifespan	5-15 Years
Pop-up	Possibly (See Below)
Pilot	Yes

Speed Humps and Speed Cushions are traffic-calming devices used to reduce vehicle speeds.

- Available in a variety of sizes, shapes, and configurations to meet different project needs.
- Can be installed with minimal roadway modifications.
- Typically secured to the pavement using anchors, bolts, or similar fastening systems.



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Modular ADA Ramp

Cost	Moderate-High
Lifespan	5-20 Years
Pop-up	Yes
Pilot	Yes

Modular ADA Ramps are accessibility ramps used to provide ADA-compliant pedestrian routes by providing accessible connections across curbs, level changes, and temporary crossings.

- Can be installed with minimal roadway modifications.
- Aligned with adjacent walking surfaces and meet ADA requirements for slopes, landings, and clear widths.



Modular Raised Street Crossing

Cost	High
Lifespan	5-10 Years
Pop-up	No
Pilot	Yes

Modular Raised Crosswalks are traffic-calming treatments used to improve pedestrian visibility, accessibility, and crossing safety.

- Can be installed with minimal roadway modifications.



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Modular Bus Platform

Cost	High
Lifespan	5-20 Years
Pop-up	No
Pilot	Yes

Modular Bus Platforms are transit stop improvements used to enhance bus stop accessibility, passenger amenities, and boarding operations.

- Can support floating bus stops, in-lane boarding, and other transit stop configurations.

Modular Traffic Circles Islands are intersection treatments used to test traffic calming strategies, improve circulation, and reduce vehicle speeds.

- Can be installed with minimal roadway reconstruction and modified as needed.
- Consider turning movements, emergency access, and accommodation of large vehicles when selecting a system.



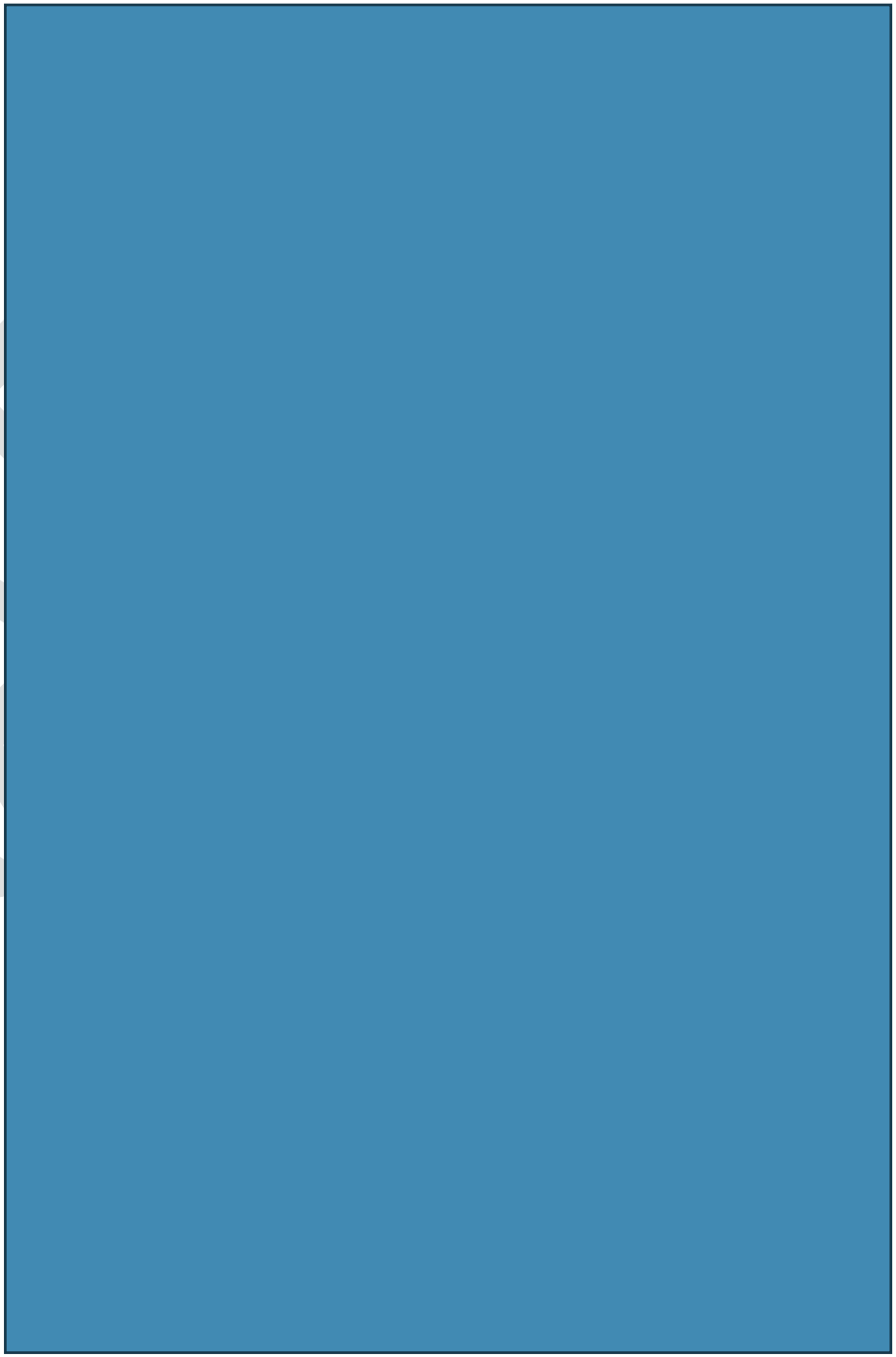


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Additional Materials

Additional materials include supporting elements that enhance the function, accessibility, comfort, and usability of quick-build design projects but do not primarily serve a demarcation or vertical delineation role. These materials may include items such as street furniture, bike racks, detectable warning surfaces, modular ADA ramps, cooling infrastructure, and transit amenities. While often used to complement other treatments, these materials can play a critical role in creating safe, accessible, and comfortable spaces for all users.



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Signage

Cost	low-Moderate
Lifespan	Varies
Pop-up	Yes
Pilot	Yes

Signage communicates project information, directs traffic, regulates use, and supports wayfinding.

- Signs should be legible, clearly communicate intention, and appropriately placed.
- All traffic control signs shall meet MUTCD dimensions and colors.
- For pop-ups, laminated signs, lawn signs, posterboard, and temporary traffic control signs are sufficient. For pilots, durable aluminum, metal, or plastic signs are preferred.



Moveable Street Furniture

Cost	low-Moderate
Lifespan	Varies
Pop-up	Yes
Pilot	Yes

Street furniture activates space and encourage people to linger.

- For pop-ups, use lightweight plastic, resin, or foldable metal furniture that is easy to move and store.
- For pilots, use steel, aluminum, hardwood, or more durable plastic furniture.
- Pop-up furniture is typically unanchored, allowing free movement of individual pieces, while pilot can anchor or attach elements to the road or one another.



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Detectable Warning Surface

Cost	Moderate
Lifespan	5-20 years
Pop-up	Yes
Pilot	Yes

Detectable Warning Surfaces are tactile treatments used at crossings, curb ramps, and other key transition areas to alert people with visual impairments to changes in the environment and potential conflict points.

- Use ADA-compliant design.
- Available as modular panels, tactile strips, and rubber sheet materials. Different patterns and products are designed for specific applications and should be selected accordingly.
- Can be installed using bolts, adhesives, or butyl pads depending on project type.



Fencing

Cost	Low-High
Lifespan	Varies
Pop-up	Yes
Pilot	Yes

Fencing is a versatile treatment used to define space and manage access.

- Available in a variety of materials and styles to suit different project needs.
- Temporary fencing can be installed as a freestanding system using bases or ballast.



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Bike Rack

Cost	Low-Moderate
Lifespan	Varies
Pop-up	Yes
Pilot	Yes

Bike Racks provide convenient and secure bicycle parking that supports access to key destinations and encourages bicycle use.

- Available as freestanding, pole-mounted, or ground-anchored installations.
- Can be selected from pre-manufactured designs or constructed from durable alternative materials such as wood or rebar.
- Provide secure support for the bicycle frame and wheel.



Shaded Elements

Cost	Low-High
Lifespan	Varies
Pop-up	Yes
Pilot	Yes

Shade Elements provide protection from heat, sun, and weather to improve the comfort and usability of public spaces.

- Pop-up options include tents and umbrellas secured with sandbags, weights, or other anchors.
- Longer-term options include shade sails, pergolas, trees, and reinforced shade structures.



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Industrial Fan

Cost	Low-Moderate
Lifespan	5-10 Years
Pop-up	Yes
Pilot	Yes

Industrial Fans reduce heat stress through air circulation, improving user comfort in public spaces, cooling corridors, and gathering areas.

- Available as portable units or mounted to temporary structures.
- Consider coverage area, noise levels, durability, and power availability when selecting fans.
- Position fans to maximize airflow while maintaining clear and accessible pedestrian routes.



Misting Tube

Cost	Moderate
Lifespan	3-10 years
Pop-up	Yes
Pilot	Yes

Misting Tubes can be used in cooling corridors and gathering spaces to reduce heat stress and improve comfort during hot weather.

- Can be mounted to temporary structures, fencing, shade elements, or other site features.
- Lightweight, portable, and relatively easy to install.
- Consider water availability, drainage, maintenance, and overspray when selecting a system.
- Position to maximize cooling benefits while maintaining accessible pedestrian routes.



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Step 3: Construction and Maintenance

Before beginning construction, project teams should identify the skills, materials, equipment, and permits needed to safely implement project.

During construction and maintenance **safety** should remain the highest priority. City staff, contractors, and community organizations must follow established safety standards and maintain safe work zones. When community members participate in pop-up project installation, activities should be supervised, matched to participants' abilities, and supported with clear safety instructions.

Simple installations can often be built with community volunteer labor using temporary materials and basic tools. More complex projects may require professional installation, traffic control measures, and coordination with local agencies.

Maintenance

Regular maintenance is essential to verify installations remain safe, functional, and effective throughout their lifespan. Actual maintenance frequency should be determined by factors such as materials, project duration, traffic volumes, weather conditions, and the level of public use. In general maintenance inspections should generally occur every 1 to 2 months when less durable materials are used and every 3 to 6 months for more durable installations.

Maintenance activities also serve as an opportunity to evaluate project performance. Maintenance crews may have the opportunity to observe the functionality of the treatment and to engage with community members to gather feedback and determine whether modifications are needed. Maintenance may also include adjusting layouts, refining design elements, or testing alternative materials based on observed conditions and community input.

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Step 4: Evaluation

Evaluation of the effectiveness of a project provides important data to determine its effectiveness and whether a project will be taken down, modified, extended, or evolved into a more advanced project type. It also informs future installations and facilitates conversations with community.

Two types of data should be gathered:

- **Quantitative data:** Traffic counts, bicycle/pedestrian counts, speed studies, crash data, and parking counts. Quantitative monitoring options include hiring a traffic count firm or having City staff strategically deploy traffic count devices. Speed trailers may serve as a secondary option, but they are less reliable, vulnerable to vandalism, and difficult to relocate.
- **Qualitative data:** User experiences and perceptions. Collect surveys, online feedback forms, community meetings, and on-street conversations. It should be noted that the outcomes can be influenced by participation rates and individual opinions.

Data should be gathered at three points in the process.

- Before the installation to establish a baseline
- After the installation allowing sufficient time of all modes to adapt to the change.
- Whenever significant design modifications occur.

Developing a standardized evaluation matrix will facilitate consistent findings and allow projects to be compared over time.

Example Goals	Criteria	Metric	Pre- Installation	Post Installation
Increase pedestrian safety	proved safety reased pedestrian activity erview Question: How safe do you l walking here?	# of crashes # of pedestrians # of people who report concerns		
Decrease Traffic Speeds	• Reduction in Travel speeds • Community survey: Do people speed in your neighborhood?	Average speed # of people who report concerns		
Decrease bicycle/vehicular conflicts	• Improved safety • Increased cyclist activity • Survey question: How safe do you feel riding here?	# of crashes # of cyclists # of people who report concerns		

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October 12, 2026

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3.14 Bicycle Facilities

3.14-1 Purpose and Applicability

Bicycle facilities shall be provided on City street projects when required by the Complete Streets Program, the adopted Bicycle Master Plan and Bicycle Priority Network, development review requirements, or project-specific direction from the City Engineer. This section establishes the sequence of decisions and design criteria engineers shall use to select, lay out, and document bicycle facilities.

3.14-1.1 Purpose

This section provides criteria and guidance for selecting and designing bicycle facilities on new construction, reconstruction, preservation, and development review roadway projects. It is intended for engineers and planners applying City standards to projects that affect bicycle travel within the public right-of-way.

Designers shall apply these criteria in conjunction with the City of Spokane Street Design Standards, Complete Streets requirements, adopted bicycle network plans, MUTCD traffic control requirements, PROWAG accessibility requirements, and applicable WSDOT and AASHTO guidance. Where criteria conflict, use the more restrictive requirement unless the City Engineer approves a documented deviation.

3.14-2 Definitions

- **Bicycle Facility:** Any portion of the public right-of-way designated or designed for bicycle travel. Facilities addressed in these standards are defined below and illustrated in Figure 33.
  - **Shared-Use Pathway**: A bidirectional, paved surface along an independent alignment or within the same right-of-way as a roadway, and physically separated from the vehicle realm.
  - **Separated Bicycle Lane**: A one- or two-way bicycle facility physically separated horizontally and/or vertically from the adjacent motor vehicle lane by bollards, a raised median, parking lane, and/or curb. Also known as a “cycle track.”
  - **Buffered Bicycle Lane**: An on-street bicycle facility delineated from the adjacent motor vehicle lane or parking lane by a striped buffer area.
  - **Striped Bicycle Lane**: An on-street bicycle facility delineated from an adjacent motor vehicle lane by a single-striped longitudinal line or, for a striped contraflow bicycle lane, a yellow double-striped longitudinal line.
  - **Contraflow Bicycle Lane**: A separated, buffered, or striped bicycle lane allowing bicycle travel opposite the direction of motor vehicle traffic on a one-way street.
  - **Shared Street**: A low-volume, low-speed street where pedestrians, bicyclists, and motor vehicles share the traveled way. Designated by City Council per SMC Section 12.08.070.
  - **Neighborhood Greenway**: A low-volume, low-speed street that has been optimized for bicycle and pedestrian travel and is designated in the Bicycle Master Plan.
  - **Paved Shoulder**: A paved edge of the roadway that can be used by bicyclists, pedestrians, and disabled or parked vehicles.

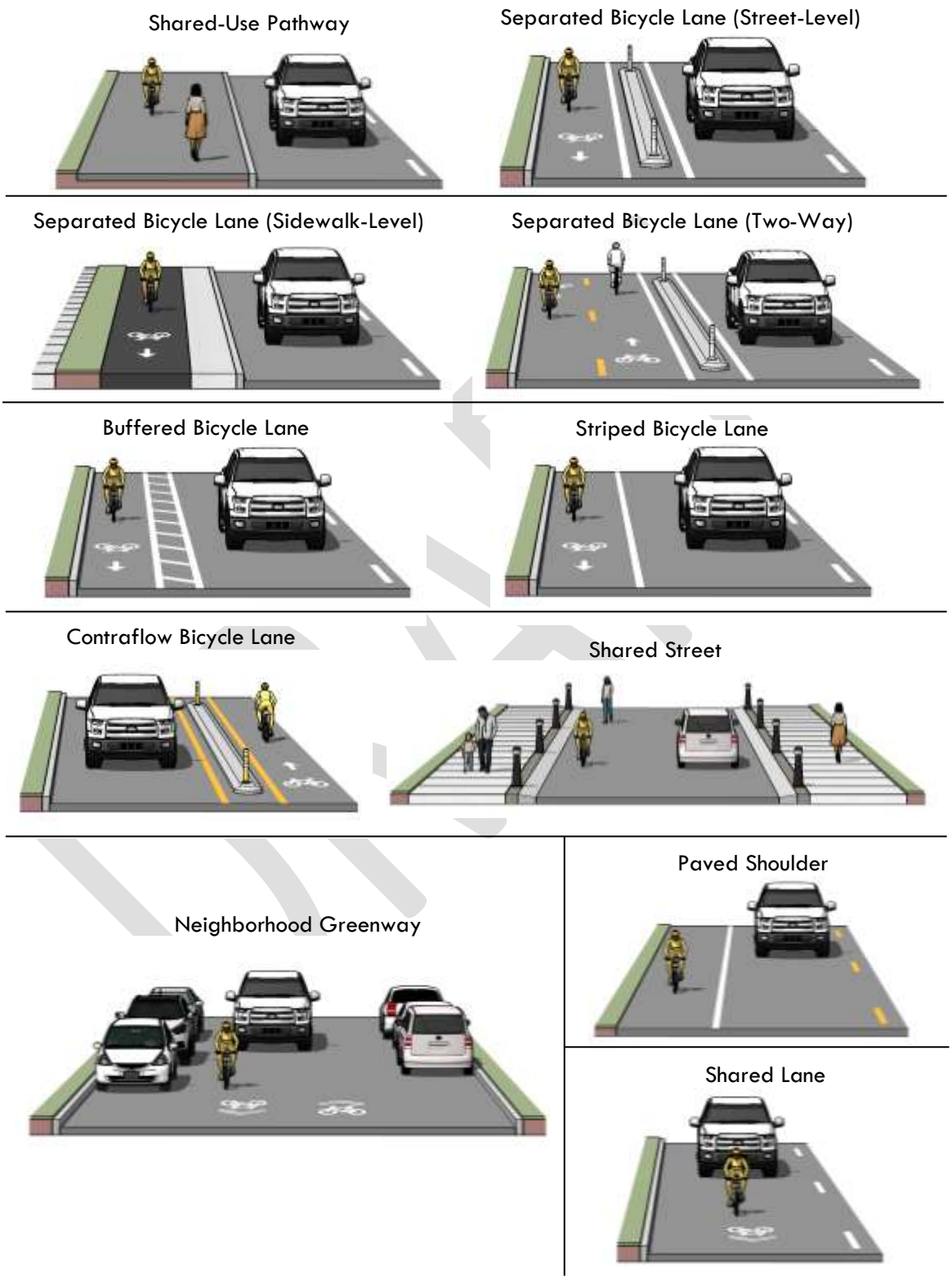
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  - **Shared Lane**: A standard vehicle travel lane where bicycles and motor vehicles operate in the same space.
- **Bicycle Route** – A bicycle facility that is part of a signed wayfinding system connecting major bicycling origins and destinations.
- **Bikeway** – A bicycle facility designated in the Bicycle Master Plan.
- **High Bicycle and Pedestrian Volume Location** – An area where a high volume of bicycle facility users (~150 bicyclists/hour or greater) is observed or expected, including but not limited to the following areas:
  - Within ¼ mile of downtown (DTC, DTG, DTU, DTS), form-based code (CA1, CA2, CA3, CA4), center and corridor (CC1, CC2, CC3, CC4), General Commercial (GC), or Community Business (CB) zoning.
  - Within ¼ mile of an STA High Performance Transit Corridor, as described in the STA Moving Forward plan.
  - Within ¼ mile of Pedestrian Priority Zones, as identified in the *Pedestrian Master Plan*.
- **Tactile Walking Surface Indicator (TWSI)** – A walking surface intentionally used to provide warning or guiding information through touch to pedestrians who are blind or have low vision, including the following:
  - **Detectable Warning Surface (DWS)** – A surface of raised truncated domes, intended to communicate the boundary between a pedestrian path of travel and a vehicular way to serve as a warning to pedestrians to check for hazards directly ahead before proceeding.
  - **Tactile Direction Indicator (TDI)** – A surface of raised parallel flat-topped elongated bars, intended to guide pedestrians along an accessible pathway, or to provide guidance on where to turn (for example, to locate a mid-block crossing, bus island, or transit door).
  - **Trapezoidal Tactile Warning Delineator (TWD)** – A long raised element that is trapezoidal in shape when viewed in profile, intended to delineate a boundary between a pedestrian area and a vehicular area; indicates there is a vehicular hazard on the other side, such as a bicycle facility, shared street, or transit lane, and is an edge treatment not to be crossed.

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Figure 33 – Bicycle Facility



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3.14-3 Bicycle Facility Selection for Street Segments

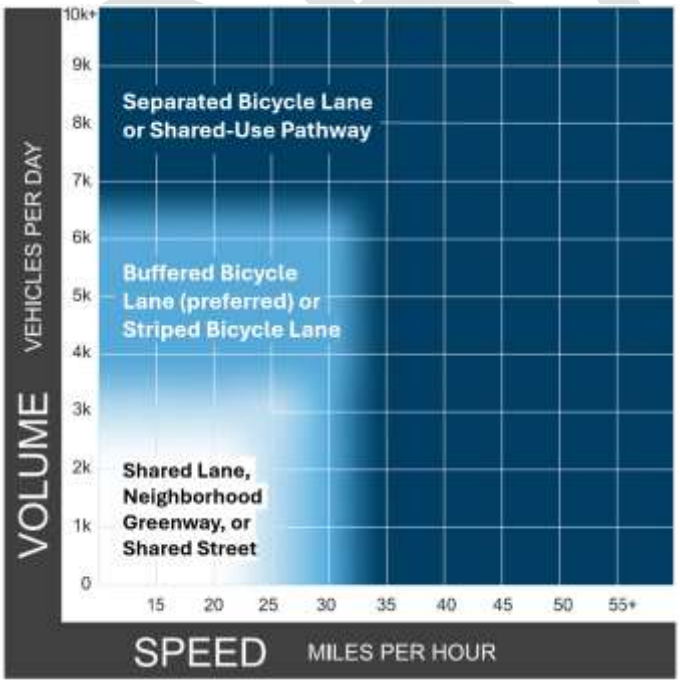
3.14-3.1 Preferred Bicycle Facility Identification

A preferred bicycle facility is one that provides a high level of bicyclist comfort, considering the roadway's motor vehicle traffic volumes and speeds, as well as the project scope. As motor vehicle speeds and volumes increase, a greater degree of separation of bicycle and motor vehicle traffic is necessary to provide sufficient bicyclist comfort and perceived safety to make the bicycle facility attractive to and used by bicyclists. Figure 34 presents general types of bicycle facilities appropriate for different combinations of motor vehicle speeds and volumes; however, Table 9 should be applied following the guidance in Section 3.14-3.2 to identify the preferred bicycle facility for a specific location.

The preferred bicycle facility identified from this section should be carried forward unless determined to be infeasible after considering reasonable design strategies to reallocate roadway space, reduce motor vehicle speeds and/or volumes, and address site-specific constraints.

- To further the implementation of the Bicycle Master Plan, it is particularly important to prioritize design strategies that would allow the preferred bicycle facility to be implemented in locations that are also designated bikeways.
- Similarly, when the preferred bicycle facility type already exists in an adjacent block, or when the same preferred bicycle facility type is identified for an adjacent block affected by the same project, it is important to prioritize design strategies that would allow the preferred facility to be implemented along multiple blocks, to provide a consistent motorist and bicyclist experience.
- With the exceptions of one-way streets and, in certain circumstances, on steeper hills (see Section 3.14-4.7), the preferred bicycle facility type applies to both roadway directions. Where appropriate, a single two-way facility may be considered in lieu of two one-way facilities.

Figure 34 – Preferred Bicycle Facility Selection



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3.14-3.2 Bicycle Facility Selection Table

Table 9 identifies preferred, secondary, and tertiary bicycle facilities for different combinations of motorized vehicle speed, motorized vehicle volume, and project type.

- The table's speed and volume thresholds are intended as guidance and not a requirement.
- Where the table calls for a choice between a shared lane, neighborhood greenway, or shared street, select between them on the following basis:
  - Neighborhood greenways: Designated in the Bicycle Master Plan.
  - Shared streets: Designated by the City Council per SMC 12.08.070.
  - Shared lanes: All other roadways.
- Where the table calls for a choice between a separated bicycle lane or a shared-use pathway, select between them on the following basis:
  - Separated bicycle lanes: High bicycle volume locations, as defined in Section 3.14-2.
  - Shared-use pathways: All other locations.
- Paved shoulders may be selected for roadways with low intersection density and no or limited on-street parking, typically in more undeveloped and rural contexts.

3.14-3.3 Strategies to Achieve the Preferred Bicycle Facility

Once the preferred bicycle facility has been identified, the desirable amount of space required to implement the facility should be determined using the design criteria presented in Section 3.14-5. In general, the "Recommended Upper Limit" values in Section 3.14-5 should be used to determine the desirable amount of space. However, it might be necessary to exceed the "Recommended Upper Limit" values in high bicycle volume locations, as discussed in Section 3.14-5.

In many situations involving retrofitting a bicycle facility on an existing roadway, there will be insufficient room to implement the preferred bicycle facility as-is. In decreasing order of priority, strategies to achieve the preferred bicycle facility consist of:

- **Reallocating road space** from other roadway users to provide sufficient space to implement the bicycle facility.
- **Reducing the space required by the bicycle facility;** note that doing so will reduce the level of comfort provided to bicyclists and may reduce the facility's functionality (for example, may not provide sufficient width to allow faster bicyclists to pass slower bicyclists).
- **Implementing measures to reduce traffic speeds and/or volumes,** which may allow a different type of bicycle facility to be implemented that requires less roadway space without compromising bicyclist comfort and perceived safety.

Strategies to reallocate road space include:

- **Narrowing travel lanes,** but no lower than the minimum allowed by Table 1.
- **Right-sizing the roadway for capacity and context** by reallocating vehicle lanes, parking lanes, or excess width.
- **Reorganizing street space** to accommodate the bicycle facility:
  - Shift on-street parking away from the curb to develop a parking-protected separated bicycle facility.
  - Convert diagonal parking to parallel parking.

  - Convert parallel parking on both sides of the street to back-in angle parking on one side of the street.
- **Remove on-street parking** to accommodate bicycle facilities where there is low parking utilization or off-street parking is available.

Strategies to reduce the space required by the bicycle facility include:

- **Reducing the facility width** from the "Recommended Upper Limit" values. The width can be reduced as low as the "Recommended Lower Limit" values given; however, to limit the impact on bicyclist comfort and facility functionality, a width between the lower and upper limits should be used when space permits. In some cases, right of way may be constrained only in a short segment (for example, due to a bridge pier or utility structure); in these cases, the facility width should only be reduced in that short segment and the "Practical Minimum" values given in Section 3.14-5 can be considered for that segment. (Note that use of values lower than the "Recommended Lower Limit" require the approval of the City Engineer.)
- **Considering a two-way facility** as an alternative to two one-way facilities. Two-way facilities are best implemented as a corridor-level strategy and may not be appropriate for all locations.

Strategies to reduce vehicle speeds and volumes include:

- **Implementing traffic calming measures,** as described in Section 3.9 and the City's Traffic Calming Toolbox.
- **Reducing the posted speed limit** in conjunction with other speed management strategies.

3.14-3.4 Downgrading from the Preferred Bicycle Facility

If, after evaluating the range of strategies presented in Section 3.14-3.3, it is determined that it is infeasible to implement the preferred bicycle facility, a downgraded facility may be considered.

- Use Table 9 to identify the "secondary bicycle facility" to consider.
- The feasibility of the secondary bicycle facility should be evaluated in the same manner as the preferred bicycle facility by first establishing the desirable amount of space for the facility and then evaluating strategies that would allow the facility to be implemented, if it cannot be implemented as-is.
- In some cases, Table 9 identifies a "tertiary bicycle facility" that may be considered and evaluated in the same way if the secondary bicycle facility is determined to be infeasible.
- When downgrading is necessary, only downgrade one direction of travel if possible.

The provision of a downgraded facility type or a determination that none of three facility types is feasible requires City Engineer approval and documentation of the decision process. A downgrade may require City Council approval per the requirements of the Complete Streets Program (SMC Chapter 17H.020).

Table 9 – Bicycle Facility Selection for Street Segments

85th % Operating Speed or Posted Speed*	AADT*	Project Type	Preferred Bicycle Facility	Secondary Bicycle Facility (Downgrade)	Tertiary Bicycle Facility (Downgrade)
<25 mph	<3k	Any	Shared lane, neighborhood greenway, or shared street		
	3k-6.5k	Any	Buffered bicycle lane	Striped bicycle lane	Shared lane
	6.5k+	Preservation	Separated bicycle lane (consider parking-protected)	Buffered bicycle lane using dimensions for separated bicycle lane	Striped bicycle lane
		New Construction or Reconstruction	Separated bicycle lane or shared-use pathway	Buffered bicycle lane using dimensions for separated bicycle lane	Striped bicycle lane
25 mph–35 mph	<3k	Any	Buffered bicycle lane	Striped bicycle lane	Shared lane
	3k-6.5k	Any	Buffered bicycle lane	Striped bicycle lane	
	6.5k+	Preservation	Separated bicycle lane (consider parking-protected)	Buffered bicycle lane using dimensions for separated bicycle lane	Striped bicycle lane
		New Construction or Reconstruction	Separated bicycle lane or shared-use pathway	Buffered bicycle lane using dimensions for separated bicycle lane	Striped bicycle lane
>35 mph	Any	Preservation	Separated bicycle lane (consider parking-protected)	Buffered bicycle lane using dimensions for separated bicycle lane	
		New Construction or Reconstruction	Separated bicycle lane or shared-use pathway	Buffered bicycle lane using dimensions for separated bicycle lane	
Any**	Any**	Any	Paved shoulder		

* The presented speed and volume thresholds are intended to be guidance and not a requirement.

** Paved shoulders may be selected for roadways with low intersection density and no or limited on-street parking, typically in more undeveloped and rural contexts.

3.14-4 General Bicycle Facility Design

This section applies to all bicycle facility types unless facility-specific information in Section 3.14-5 provides more restrictive requirements. Establish the basis of design using bicycle design vehicle characteristics, usable operating width, shy distances, alignment and geometry, taper rates, pavement quality, drainage, crossings, maintenance, and accessibility.

3.14-4.1 Bicycle Design Vehicle Characteristics

Table 10 summarizes controlling design characteristics for bicycle users.

- The high speed and length values correspond to a Class 1 or Class 2 electric cargo bicycle.
- The low speed value corresponds to a conventional bicycle pedaled at a leisurely rate.

Table 10 – Bicycle Design Vehicle Characteristics

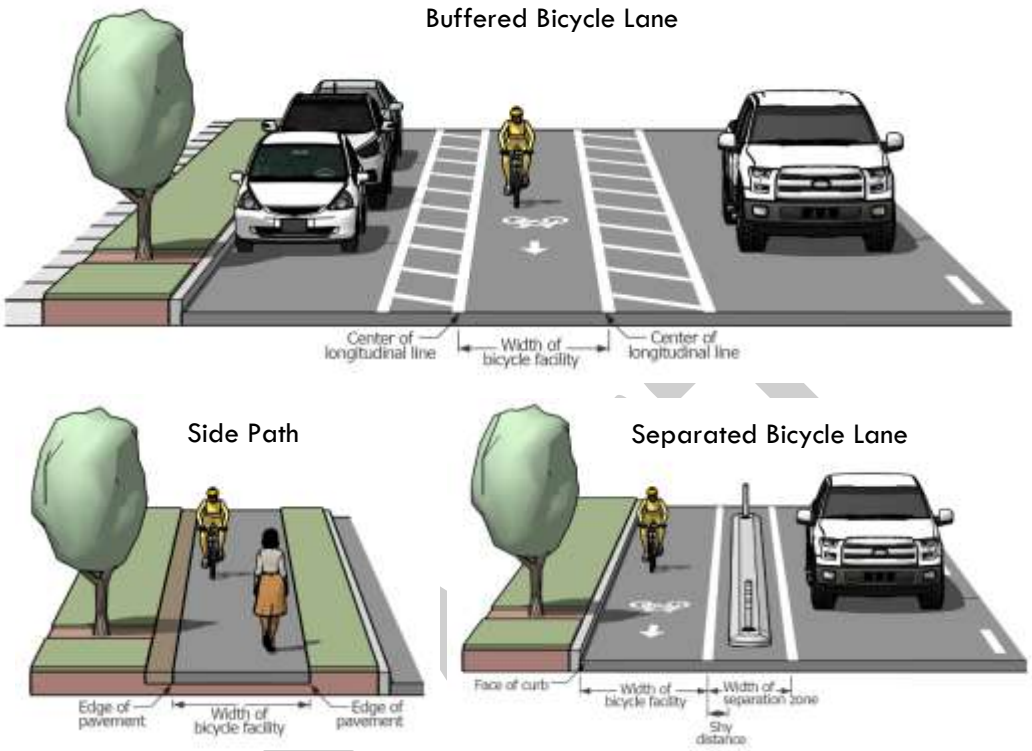
Characteristic		Value
Speed (paved, level terrain)*		20 mph (high); 8 mph (low)
Acceleration rate		2.5 ft/s^2
Deceleration rate		10 ft/s^2 (typical), 5 ft/s^2 (wet or downhill)
Perception-reaction time		2.5 s
Operating space	Operating width	5 feet (minimum 3.5 feet allowed for limited distances, where constrained)
	Operating height	10 feet (minimum 8 feet allowed for limited distances, where constrained)
	Length	8 feet
* For every 1% increase in **uphill** grade, **low** speed is reduced by 0.9 mph. For every 1% increase in **downhill** grade, both **high** and **low** speed are increased by 0.5 mph.		

3.14-4.2 Measuring Bicycle Facility Width

Bicycle facility width is the unobstructed usable operating space available to the user. Use the most constrained dimension measured from the edge of pavement, face of curb, gutter line, center of longitudinal stripe, edge of buffer, or vertical separation element, as applicable (Figure 35).

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Figure 35 – Measuring Bicycle Facility Widths



Illustrative; not for design.

3.14-4.3 Shy Distance

Shy distance is the buffer between a bicyclist and a vertical obstruction. Shy distances are already included in bicycle facility width tables throughout Section 3.14-5 for vertical objects (for example, curbs) that are standard elements of a particular bicycle facility type. Additional shy distance should be considered, using the values in Table 11, as other vertical elements are introduced adjacent to a bicycle facility.

Table 11 – Shy Distance from Common Objects

Object Type	Shy Distance
Tall (≥2 feet high) objects such as railings, barriers, trees, guy wires, flexible delineator posts, traffic signs, and supportive posts	2 to 3 feet (1 foot permitted, where constrained)
Vertical curbs and objects less than 2 feet in height	1 to 2 feet (0.5 feet permitted, where constrained)
Sloping, beveled, or mountable curbs	0.5 to 1 feet (zero permitted, where constrained)

3.14-4.4 Alignment and Geometry

Bicycle facility curve radii, cross slopes, and vertical clearances should adhere to the values provided in Table 12.

Table 12 – Geometric Design Values

Parameter	Design Value		Notes
Curve Radius	Minimum 10 feet		5 feet allowed in constrained conditions.
Cross Slope	Shared-use pathways	Less than 2% (required per PROWAG)	Design at 1.5% to provide surface drainage and allow for construction tolerances Cross slopes should be transitioned at a maximum rate of 5 feet for each 1% change in cross slope.
	All other bicycle facilities	Less than 2% Up to 8% in a horizontal curve	
Vertical Clearance	Minimum 10 feet		8 feet allowed in constrained conditions; provide advance warning signs where less than 10 feet.

3.14-4.5 Tapers

This taper rate applies to bicycle lane shifts around vertical obstructions and traffic calming treatments. Where the taper affects motorized vehicle travel paths, determine the taper length based on MUTCD guidance.

Where the taper does not affect a motorized vehicle path of travel, the minimum length is determined using the following equation:

$$L = \frac{WS^2}{60}$$

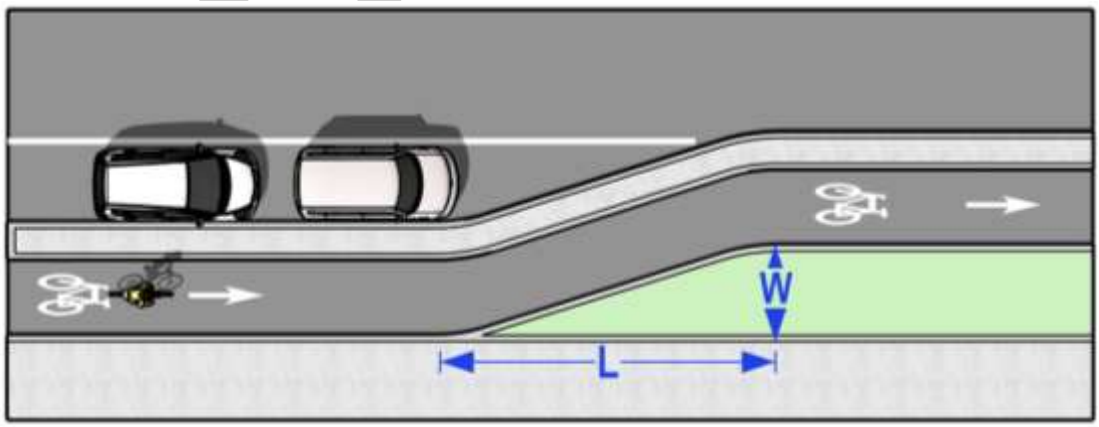
Where: L = longitudinal lane shift length (feet), minimum 20 feet, as shown in Figure 36

W = lateral offset width (feet), as shown in Figure 36

S = target bicyclist operating speed (mph), assumed 20 mph unless facility-specific guidance recommends a higher speed, such as on steep downgrades (see Section 3.14-4.7).

A practical minimum taper rate of 1:3 (W:L) may be used in high-pedestrian contexts (per Section 3.14-2), along short blocks, and in other locations where low bikeway speeds are desired (e.g., approaching a stop-controlled intersection, midblock crossing, or transit stop). Bidirectional bicycle facilities should use a minimum taper rate of 1:5.

Figure 36 – Shifting Taper



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3.14-4.6 Pavement and Surface Considerations

3.14-4.6.1 Pavement

General Guidance

- All bicycle facilities should be paved with either asphalt or concrete.
- Do not use crack sealants or patching materials that remain soft or deform under bicycle loads.
- Where a gutter is provided within the bicycle facility, the following conditions should be met:
  - The longitudinal joint or seam at the gutter should provide a smooth seam along the bikeway.
  - The cross slope of the gutter should match the cross slope of the roadway, per Standard Plan No. F-106.
- When bicycle facilities are installed adjacent to unpaved driveways and alley, those driveways and alleys should be paved per Standard Plans W103 through W-105 within 30 feet of the bicycle facility if the driveway or alley is high-use (per Section 3.14-8.1), and within 10 feet otherwise to minimize the tracking of dirt and gravel onto riding surfaces. Where practical, the paved section should be sloped away from the bicycle facility.

Asphalt Considerations

- Latitudinal and longitudinal seams falling within bikeway should be flush (less than 1/4 inch height difference).
- Avoid longitudinal pavement seams along bicycle wheel paths.
- Chip seal treatments should be avoided on bicycle facilities, but when they are used:
  - Use an aggregate size of 3/8 inches or less. Where practicable, use an aggregate size of 1/8 inch specifically on the bikeway portion of the roadway.
  - Sweep the chip-sealed surface within 24 hours of placement to remove loose aggregate, or apply a slurry or fog seal on top of chip-sealed bikeway surfaces.

Concrete Considerations

- Use sawcut transverse joints or square-edge troweled joints.
- Longitudinal joints within the bicycle facility should be avoided.
- Use repair materials that do not remain pliable under bicycle wheels.

3.14-4.6.2 Drainage Grates and Other Utilities

Where practicable, install grates entirely within the gutter. If drainage grates, manhole covers, or utility boxes are located within a bicycle facility:

- Provide at least 3 feet of lateral clearance between the drainage inlet grate and the roadway-side edge of the bicycle facility, where practicable.
- Keep grates and manhole covers flush with the bicycle facility surface.
- Use bicycle-compatible drainage grates with openings that prevent tires from dropping into the grate, such as vaned, herringbone, or other grates with openings 4 inches or less center to center and perpendicular to travel.
- Limit the gap between the grate or cover and frame to 0.5 inches or less.

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3.14-4.7 Bicycle Facilities on Hills

Provide an uphill bicycle lane and a downhill shared lane where all the following conditions apply:

- A striped, buffered, or separated bicycle lane is the selected facility type.
- Available width allows a bicycle lane in only one direction without downgrading the facility type in the opposite direction (see Section 3.14-3).
- The downhill grade exceeds 5 percent for 500 feet or more.

The downhill shared lane developed through the provisions of this section is considered a downgraded facility and should follow the documentation and approval processes described in Section 3.14-3.

3.14-4.8 Railroad Grade Crossings

Whenever a bicycle facility crosses railroad tracks:

- The bicycle facility width should not be decreased.
- The flangeway depth and width should be kept to a minimum.
- The crossing should be at a 60-90 degree angle to the rails.
  - The angle may be reduced to 30 degrees where constrained.
  - Where a skew is unavoidable, the shoulder or bicycle facility should be widened to permit bicyclists to cross at their preferred angles.
  - Where the fastest path for bicyclists results in crossing at less than 60 degrees, striping should guide bicyclists to approach the crossing at the recommended angle. A Skewed Crossing (MUTCD W10-12) sign should be posted in these instances.
- An MUTCD W10-1 sign should be posted in advance of the crossing.

3.14-4.9 Barriers and Fall Protection

Where a bicycle facility is adjacent to a hazardous condition such as a body of water or steep downward slope, a shoulder of at least 5 feet should be provided. Where a sufficient shoulder is not provided, a physical barrier, railing, or fencing (collectively "barriers," for the purposes of this section) should be considered where a bicycle facility is adjacent to any of the following conditions:

- Slopes 1V:3H or steeper, with a drop of 6 feet or greater.
- Slopes 1V:2H or steeper, with a drop of 4 feet or greater.
- Slopes 1V:1H or greater, with a drop of 1 foot or greater.
- A body of water.
- Another substantial hazard.

The barrier should:

- Begin prior to and extend beyond the area of need.
- Be placed outside the bicycle facility's shy distance (see Section 3.14-4.3).
- Have its ends flared away from the edge of the bicycle facility at a rate of at least 1:4.
  - The ends should be marked with object markers where they are within 2 feet of the edge of the bicycle facility.

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- Be a minimum of 42 inches high.
  - On bridges or where bicyclists could impact the barrier at a 25 degree angle or greater (such as along a curve), a taller barrier up to 54 inches should be considered.

On bridges, the barrier should not have openings greater than 6 inches wide for the lower 27 inches.

Where the shoulder between the bicycle facility and the barrier is paved, a white edge line should be provided to identify the edge of the recommended operating space, placed at the shy distance away from the barrier (see Section 3.14-4.3).

Where a bicyclist's handlebars could come into contact with a barrier, a smooth, wide rub-rail may be installed between 36 and 44 inches in height.

Where user volumes are low and the bicycle facility is less than 30 inches above the grade of the adjacent hazard or slope bottom, a toe board with a height of at least 3.5 inches may be considered in lieu of a barrier.

3.14-4.10 Maintenance Considerations

Consider maintenance operations when selecting and designing a bicycle facility.

- Maintain a clear width of at least 6.5 feet between vertical separation elements and curbs to allow for the use of the City's bicycle lane snowplow.
- Four feet of effective bicycle facility width should be maintained throughout the winter.
- A clear width of 13 feet should be maintained for travel lanes adjacent to separated bicycle lanes where practical to allow for snowplow operation.
- Tall, non-mountable elements such as concrete barriers and planters should not be used where less than 14 feet is available between the separation element and adjacent roadway constraints, unless an alternative snow storage strategy is provided.

3.14-4.11 Quick-Build Materials

Quick-build materials may be used to provide bicycle facilities, as described in the Quick Build Guide.

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3.14-5 Design of Bicycle Facilities along Street Segments

This section provides design criteria for each bicycle facility type. While the general design criteria in Section 3.14-4 apply to all bicycle facilities, each facility type has unique operational, geometric, and contextual requirements that influence its design. Apply the general design criteria in Section 3.14-4 first and then use the facility-specific criteria in this section to establish dimensions, buffers, separation, markings, and supporting elements.

- The widths given in the tables in this section include shy distances from continuous elements adjacent to the bicycle facility that are part of the standard facility design (for example, curbs). Appropriate shy distances from Table 11 in Section 3.14-4.3 should be added to these widths as needed to account for intermittent obstacles (for example, sign posts) or continuous elements such as bridge railings not part of the standard facility design.
- The use of any value lower than the Recommended Lower Limit given in the tables in this section requires the approval of the City Engineer.
- Practical maximums apply in high bicycle volume locations, as defined in Section 3.14-2.

3.14-5.1 Shared-Use Pathways

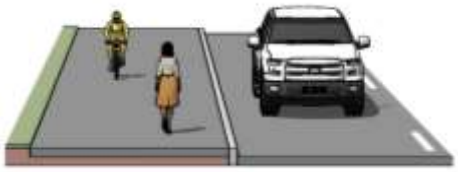


Table 13 provides design widths for shared-use pathways. Table 14 provides street buffer widths for shared-use pathways located adjacent to streets.

- Shy distance to vertical elements adjacent to the shared-use pathway should be provided (see Section 3.14-4.3). Vertical elements should not reduce the useable width of the shared-use pathway below the Recommended Lower Limit.
- The Recommended Lower Limit corresponds to the pathway width that allows two people traveling side-by-side to be passed by other users.
- If site constraints require the Practical Minimum width to be used, it should only be used for short segments.
- If site constraints require two one-way paths to be used for short segments, each path should be at least 6.5 feet wide to allow for snowplow operations.
- Values in excess of the Recommended Upper Limit should be considered in high bicycle use locations (see Section 3.14-2) where bicyclists and pedestrians are separated.
- Widths less than 10 feet should not be used where a pathway is expected to be used by authorized motor vehicles such as maintenance, emergency, or patrol vehicles.
- If no buffer width is provided between a shared-use pathway and the adjacent street, the shared-use pathway should be at least 10 feet wide.

Table 13 – Shared-Use Pathway Widths

Expected Bicycle User Volume	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit	Upper Limit	
High (per Section 3.14-2)	11	12	16	20
All other locations	8	10	12	13

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Table 14 – Buffer Widths for Shared-Use Pathways Adjacent to Streets

Condition	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit	Upper Limit	
Roadway operating speeds < 30 mph, no parking present	0*	2	6	12
Roadway operating speeds ≥ 30 mph, no parking present	3	4	8	12
* If a buffer is not provided, shared use pathway width should be at least 10 feet.				

Apply the following design considerations to shared-use pathways:

- **Design speed:** Design shared-use pathways for 20 mph. Use a design speed of 30 mph in hilly terrain where grades are greater than 5 percent for at least 500 feet.
- **Cross slope:** Provide a maximum cross slope of 2 percent. Design to 1.5 percent to support bicycle comfort, drainage, and construction tolerance.
- **Geometric design:** Design horizontal and vertical alignment, stopping sight distance, and edge treatments consistent with WSDOT *Design Manual* Chapter 1515, Shared-Use Paths.
- **Motor vehicle access:** As needed to address vehicle documented vehicle incursion on a pathway, provide removable bollards, flexposts, or raised islands at pathway access points.
  - Stripe a yellow centerline envelope around the bollard, flexpost, or island, providing the appropriate shy distance (per Table 11) around the object. Taper the envelope per Section 3.14-4.5.
  - Maintain 5-6 feet of clearance around either side of the centerline envelope. A minimum of 4 feet of clearance is allowable, where constrained.
  - Bollards should be a minimum of 40 inches tall and 4 inches in diameter. They should be marked with retroreflective material on all sides or with appropriate object markers per the MUTCD. They may be internally lit but should adhere to all the visibility requirements of non-lit bollards in that case.
  - Removable bollards should be fully removable (not "lay-down") and receiver hardware should include a permanently-affixed cap that is flush with the pathway surface when the bollard is removed.
- **Crossings of driveways and roadways:** Shared-use pathway crossings should be designed as pedestrian crosswalks. Additional warning signs, indicating that crossing motorists should look for bicycle traffic in both directions, may be provided.
  - Horizontal curves may be used to encourage slower bicyclist speeds near intersections where they are required to stop. Place curves in advance of the intersection to allow bicyclists to navigate the curve first before dedicating their attention to the crossing. Provide a solid centerline stripe within the curve.
- **Shoulders**: **Driveway and roadway crossings:** Design shared-use pathway crossings as pedestrian crosswalks. Consider warning signs directing motorists to look for bicycle traffic in both directions.
- **Shoulders:** Where the path is not adjacent to a roadway or built feature, provide a shoulder with a maximum cross slope of 1V:6H (16.7%). Provide a 5-foot shoulder where feasible; a minimum 2-foot shoulder may be used for short, constrained segments. Where adequate

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shoulder width is not feasible and substantial grade changes are present, provide fall protection per Section 3.14-4.9.

- **No Passing zones:** Provide a solid yellow centerline on shared-use pathways in no-passing zones, including:
  - Within 50 feet of intersections or crossings.
  - Along horizontal and vertical crest curves or other locations with limited sight distance.
- **Separation of Users:** Where bicycle and pedestrian conflicts are observed or expected, consider modal separation, such as a two-way separated bicycle lane with an adjacent sidewalk or pedestrian pathway.
  - Where a shared-use pathway merges with or diverges from a mode-separated facility, provide a tactile directional indicator across the bicycle-specific entrance to guide pedestrians with vision disabilities to the pedestrian facility.

3.14-5.2 Separated Bicycle Lanes

3.14-5.2.1 One-Way Street-Level Separated Bicycle Lanes



Street-level separated bicycle lanes are located adjacent to the curb and are separated from vehicle traffic by vertical elements (see Section 3.14-5.2.4).

Table 15 provides one-way street-level separated bicycle lane widths. Figure 35 in Section 3.14-4.2 illustrates how these widths are measured.

Table 15 – One-Way Street-Level Separated Bicycle Lane Widths

Outside (Sidewalk-Side) Edge of Bicycle Lane	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit	Upper Limit	
Street-Level Separated Bicycle Lane				
Vertical curb (without gutter)	4	5.5	7.5	9
Vertical curb (with gutter)	4.5	6	8	9.5

Table 16 provides buffer widths between all street-level separated bicycle lanes and the street.

- The street buffer should be delineated with 4- or 6-inch longitudinal stripes on both sides, per the MUTCD, spaced from the vertical element at an appropriate shy distance as provided in Table 11 in Section 3.14-4.3, or 1 foot, whichever is greater.
- The street buffer width is measured from longitudinal stripe to longitudinal stripe.
- The street buffer may be provided using only a standard vertical curb.
- The longitudinal line on the bicycle lane side of the buffer may be omitted where continuous separation elements (such as precast curb, cast-in-place islands, or concrete barriers) are used.
- Street buffer widths exceeding the Recommended Upper Limit shown in Table 16 should be considered on multilane roadways, on streets posted above 35 mph, when adjacent to loading zones or accessible parking, at transit stops, and along two-way separated bicycle lanes (see Section 3.14-5.2.3).

Table 16 – Street-Level Separated Bicycle Lane Street Buffer Widths

Vertical Element	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit	Upper Limit	
Tall object (≥ 2 feet tall)	3	4	6	8
Vertical curb, raised island, or another object under 2 feet tall	2.5	3.5	5.5	8
Parking separation	2	2.5	3	4

3.14-5.2.2 One-Way Sidewalk-Level Separated Bicycle Lanes



Sidewalk-level separated bicycle lanes are level with the sidewalk (typically 6 inches above the roadway surface). Table 17 provides lane widths for these facilities. Figure 35 in Section 3.14-4.2 illustrates how these widths are measured.

- The sidewalk buffer should be 1 to 3 feet wide.
- The combined width of the bicycle lane and the street buffer should be at least 6 feet.
- Where right-of-way is constrained, the sidewalk buffer width should be reduced before reducing the street buffer width.
- Visual contrast between the bicycle lane and the sidewalk surface should be provided using different pavement materials, green-colored pavement markings in the bicycle lane, and/or regular bicycle symbol markings in the bicycle lane.
- Sidewalk buffers should incorporate a detectable edge between the sidewalk and the bicycle facility, such as a tactile warning delineator, to guide pedestrians with vision disabilities.

Table 17 – One-Way Sidewalk-Level Separated Bicycle Lane Widths

Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
	Lower Limit	Upper Limit	
4	5	7	8

3.14-5.2.3 Two-Way Separated Bicycle Lanes



Table 18 provides design widths for two-way separated bicycle lanes. For street-level facilities, provide street buffers consistent with Section 3.14-5.2.1. For sidewalk-level facilities, provide sidewalk and street buffers consistent with Section 3.14-5.2.2.

- Delineate opposing bicycle travel directions with a dashed yellow centerline, per the MUTCD.
- Use green-colored pavement markings for at least the first 20 feet of each block.

Table 18 – Two-Way Separated Bicycle Lane Widths

Outside (Sidewalk-Side) Edge of Bicycle Lane	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit[2]	Upper Limit	
Vertical curb (with gutter)	8	9.5	11.5	15.5
Vertical curb (without gutter) or at sidewalk level	7.5	9	11	15

3.14-5.2.4 Vertical Separation Elements

Separated bicycle lanes include one or more vertical separation elements between the bicycle lane and the adjacent motor vehicle lane. Vertical elements should be:

- Installed a minimum of 1 foot from the center of the vehicle lane edge line to accommodate shy distance and maintenance of the edge line with a striping truck.
- Include breaks in the separation elements to allow for stormwater drainage.
- Set back from intersection driveways, mailboxes, and transit stops per Table 19.
- Omitted where adjacent openings would result in less than 10 feet of continuous separation between features.

Table 19 – Breaks for Vertical Separation Elements

Feature	Near side of feature	Far side of feature
Intersections*	Greater of back of intersecting sidewalk or 12 feet from curb face	Greater of back of intersecting sidewalk or 12 feet from curb face
Driveways and alleys*	Greater of driveway wing or 10 feet from driveway throat.	Greater of driveway wing or 10 feet from driveway throat.
Mailboxes	25 feet, omitted if bicycle lane provides at least 8 feet clear width	25 feet, omitted if bicycle lane provides at least 8 feet clear width
Bus stops	10:1 taper	5:1 taper
* If there is evidence that a specific design vehicle (see Section 3.11-1) regularly requires a larger opening, consider a mountable separator end.		

The following vertical elements may be used to provide vertical separation for separated bicycle lanes, individually or in combination:

- **Raised islands** should be constructed per Standard Plan F-108. Raised islands:
  - May use a vertical curb on the motor vehicle side where adjacent to a parking lane but should maintain a doweled curb adjacent to the bicycle facility to reduce the likelihood of pedal strikes.
  - May incorporate pedestrian refuge spaces and forward queuing areas for bicycles (see Section 3.14-6.3.6) if they are 6 feet or wider.
  - May include street furniture and other appurtenances (e.g., light poles, mailboxes); however, these may require additional shy distance to be provided.
  - Should include vertical markers on the island noses to support winter maintenance operations, per Standard Plan XYZ.
- **Traffic separators (or parking stops)** are typically 4 inches tall and 16–24 inches wide and may be precast or cast-in-place. Separators:
  - May be installed as individual segments or placed next to each other to create a continuous curb.

  - Should include a sloped curb on the bicycle lane side of the separator, where the street buffer width results in less than 1 foot between the separator and the bicycle lane or where a longitudinal line is not provided on the bicycle lane side of the street buffer.
  - Should be anchored or dowelled into the pavement.
  - Should be supplemented with flexible delineator posts at intersections and driveways.
- **Concrete barriers** may be standard height (32 inches tall) or half-height (18 inches tall).
  - Crash cushions or a sloped end treatment should be provided at barrier ends as recommended in the AASHTO *Roadside Design Guide*.
- **Planters** are typically 48 inches long, 20 inches wide, and 23 inches tall.
  - Planters may be closely (4 feet between planters) or intermittently (up to 20 feet) spaced.
  - Provide a minimum street buffer width of 44 inches, to provide a 1-foot shy distance to both the adjacent vehicle lane and bicycle lane.
  - Include plantings that will maintain sightlines when they mature.
  - When used where posted speeds are 30 mph or greater, planters should be closely spaced (approximately 4 feet between planters) and should not be anchored to the pavement.
  - Planters should be marked with retroreflective material on all sides or with appropriate object markers per the MUTCD.
- **Rigid bollards** should:
  - Be spaced 10 to 20 feet apart, on center.
  - Be crashworthy when placed in the clear zone, per the AASHTO *Roadside Design Guide*.
  - A minimum of 40 inches tall and 4 inches in diameter.
  - Marked with retroreflective material on all sides or with appropriate object markers per the MUTCD. They may be internally lit but should adhere to all the visibility requirements of non-lit bollards in that case.
- **Vehicle parking** lanes may be used in lieu of or in addition to other vertical elements. The parking lane should be 8 feet wide but may be reduced to 7 feet in constrained conditions.
  - A striped buffer (with or without vertical separation elements) should be placed between the bicycle lane and the parking lane, using the dimensions provided in Table 21.
  - Where the parking lane is expected to have low or infrequent utilization, use vertical separation elements between the parking lane and the separated bicycle lane.
- **Flexible delineators** may be used as a vertical separation element for temporary installations or in combination with a more permanent element.
- **Other elements** may be used with the approval of the City Engineer.

3.14-5.2.5 Pedestrian Crossings of Separated Bicycle Lanes

Provide crossing markings at designated pedestrian crossings of separated bicycle lanes.

At intersections, align pedestrian crossings of separated bicycle lanes with the crosswalk of the motorist travel lane(s).

At midblock crossings (including at bus stops), provide yield lines and (optionally) STOP HERE FOR PEDESTRIANS (MUTCD R1-5b) signs a minimum of 4 feet in advance of the crosswalk.

- Yield lines shall be per the MUTCD.

3.14-5.3 Striped and Buffered Bicycle Lanes

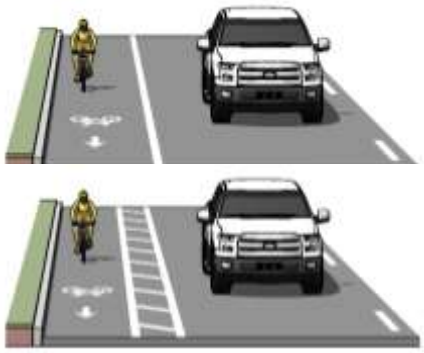


Table 20 provides design widths for striped and buffered bicycle lanes. Buffered bicycle lanes use striping to increase lateral separation from adjacent motorized vehicle or parking lanes. Mark striped and buffered bicycle lanes per the MUTCD.

Where feasible, provide striped buffers using the widths shown in Table 21. Where space is available to provide buffer widths of 6 feet or more, consider installing separated bicycle lanes instead.

- Where a buffer separates the bicycle lane from the adjacent travel lane, the width of the bicycle lane may be reduced to the practical minimum to provide an increased buffer width; this adaptation does not require City Engineer approval. Vehicle lanes adjacent to bicycle lane buffers may be reduced to 10 feet to increase buffer width. Where 10-foot vehicle lanes are used, large-vehicle mirrors may overhang the buffer, and design vehicles may occasionally encroach into the buffer during turning movements.
- Use the Recommended Upper Limit for buffer width whenever feasible.
- Buffered bicycle lanes, separated bicycle lanes, or two-way separated bicycle lanes should be considered in lieu of striped bicycle lanes 8 feet or wider to avoid confusion with a parking or travel lane.
- Where striped bicycle lanes 7 feet or wider are provided, install green-colored pavement markings in the bicycle lane for at least the first 20 feet of each street block to avoid confusion with a parking or travel lane.
- Design values in Table 20 for high bicycle volume locations are intended to accommodate occasional passing or side-by-side riding. A minimum of 6.5 feet is necessary for occasional passing and 8 feet or more for comfortable side-by-side cycling.

Table 20 – Striped and Buffered Bicycle Lane Widths

Outside (Sidewalk-Side) Edge of Bicycle Lane	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit	Upper Limit	
Edge of pavement	4	5	7	8
Curb (without gutter)	5	6	7	8
Curb (with gutter)	5.5	6.5	7	8
Vehicle turn lane	5	6	7	8
Striped buffer	4	5	7	8
Parking lane	5	6	7	8
High bicycle volume locations (see Section 3.14-2)	6.5	8	10	11

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Table 21 – Bicycle Lane Buffer Widths

Buffer location	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
		Lower Limit	Upper Limit	
Between bicycle lane and travel lane	1	2	4	6
Between bicycle lane and parking lane	2	2.5	3	4

3.14-5.4 Contraflow Bicycle Lanes



Contraflow bicycle lanes may be separated, striped, or buffered. Apply the following MUTCD guidance:

- Use a buffered or separated contraflow bicycle lane where the posted speed limit is 35 mph or greater.
- Do not place a contraflow bicycle lane between a general-purpose lane and on-street parallel parking.
- Separate the contraflow bicycle lane from the adjacent vehicle lane with a solid double-yellow centerline, striped or raised median island, or physical separation.
- Use lane extension markings where contraflow bicycle movements cross intersections (see Section 3.14-9.2.4).
- Provide bicycle lane symbols and directional arrows on both intersection approaches and departures to reinforce the intended bicycle travel direction.

Align contraflow bicycle lanes with typical two-way roadway operations where feasible to reduce conflicts with right-turning vehicles. Locate a contraflow bicycle lane in the path of right-turning vehicles only where needed for network connectivity; in these conditions, design the facility as a separated bicycle lane.

3.14-5.5 Shared Streets



Shared streets are designated by the City Council per SMC Section 12.08.070 and designed per SMC Section 12.08.071. Traffic control devices should be posted following the installation of the required features and to define entrance locations.

Provide the following signs for shared streets:

- 10 mph speed limit signs.
- Signs requiring vehicles to yield to pedestrians (see Section 3.14-9.1.5).

Provide the following elements to support pedestrians with vision disabilities:

- Pedestrian-only zones at least 5 feet wide on both sides of the shared street, delineated from the central aisle of the roadway using flush curbs, pavement variations, trapezoidal warning delineators, and/or bollards.
- Use tactile direction indicators and detectable warning surfaces at designated midblock crossings and to delineate an unobstructed path of travel.

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3.14-5.6 Neighborhood Greenways



Neighborhood Greenways are low-volume and low-speed streets that are optimized for bicycle and pedestrian travel. The following are desirable elements of neighborhood greenways; however, the design of the neighborhood greenway is flexible and should be tailored to meet the specific needs of the roadway and its surroundings.

- **Stop control:** Orient stop signs toward cross-street traffic at local street intersections to allow free-flowing bicycle travel on the neighborhood greenway. See Section 3.14-9.1.1 for further considerations.
- **Traffic calming and diverters:** Use traffic calming treatments and diverters to maintain target motor vehicle speeds and volumes.
  - Target traffic conditions on neighborhood greenways are 1,000 AADT and 150 vehicles during the peak hour. Practical maximum conditions are 2,000 AADT and 300 vehicles during the peak hour.
- **Major street crossings:** Provide enhanced crossing treatments where neighborhood greenways intersect collector or arterial roadways, consistent with Section 3.14-6.4.
- **Centerline markings:** Neighborhood greenways should not have centerline markings.
  - Centerline markings may be installed for up to 50 feet on approaches to controlled intersections or traffic calming treatments such as traffic circles but should not continue through the full block.
- **Signs and wayfinding:** Provide signs and wayfinding consistent with Section 3.14-9.

3.14-5.7 Paved Shoulders



Table 22 provides design paved shoulder widths for use in situations where a paved shoulder is selected as the bicycle facility.

- When a paved shoulder less than 4 feet wide is provided, the shoulder will generally perform similarly to a wide outside line because bicyclists will not be able to operate completely within the shoulder.
- A shared lane (see Section 3.14-5.8) may be used in lieu of a paved shoulder under the conditions shown in Table 22.
- Shared-use pathways (see Section 3.14-5.1) are preferred when design year ADT exceeds 7,000 and the 85th percentile speed exceeds 35 mph.

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Table 22 – Paved Shoulder Bicycle Facility Widths

Design year ADT	85th percentile speed (mph)	Practical Minimum (feet)	Recommended Range (feet)		Practical Maximum (feet)
			Lower Limit	Upper Limit	
< 2,000	≤ 25	Shared lane			
	> 25	2	4	6	10
2,000 – 7,000	All	4	5	8	10
> 7,000	≤ 35	5	6	8	12*
	> 35	5	8	10	12*
* Where more than 10% of traffic consists of heavy trucks, buses, or recreational vehicles.					

Apply the following marking guidance to paved shoulder facilities:

- Shoulders should be designated with a solid white 6-inch edge line along the outer edge of the rightmost travel lane.
- Dotted edge line extensions should be placed through intersections and across accesses.
- Bicycle symbol markings, "BIKE LANE" word markings, or shared-lane markings **shall not** be provided.

3.14-5.8 Shared Lanes

Bikeways designated as shared lane facilities are denoted with sharrow symbols (see Section 3.14-9.2.5). Sharrow markings may be used, but are not required, on non-bikeway shared lane facilities.



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3.14-6 Design of Bicycle Facilities at Intersections

Intersection design should designate visible paths for bicycles, minimizing exposure to vehicle conflict points. In locations where motorized vehicle paths are expected to encroach on bicycle facilities, bicycle conflict markings should be used (see Section 3.14-9.2.4).

- See Section 3.11-1 to select design and accommodated vehicles, and for general design considerations related to motorized vehicle accommodation.
- See Section 3.11-2 for general design guidance related to curb radii.

3.14-6.1 Intersection Sight Distance and Clear View Triangles

General Guidance

See Section 3.11-4 for general guidance on clear sight triangles at intersections. This section provides additional guidance for three scenarios specific to bicycle facilities:

- Bicyclist crossing an uncontrolled roadway from a stop-controlled minor road
- Turning motorist crossing a separated bicycle lane or shared-use pathway
- Pedestrian crossing of an uncontrolled separated bicycle lane approach

Clear view triangles along bicycle facilities should be kept clear of obstructions between 2 and 7 feet above the ground to accommodate a range of eye heights and provide visibility for a range of bicycle types.

- Less dense, semi-transparent objects (for example, transit shelters, signposts, or bicycle racks) may remain within clear view triangles.
- Parked vehicles are considered a sight obstruction.
- Trees generally will not present sight obstructions provided their limbs are cleared between 2 and 7 feet high and their mature trunk diameter remains small.

Where adequate sight distance and/or clear view triangles cannot be provided, consider advanced warning signs and/or enhanced crossing treatments including stop control or red indication to manage potential conflicts.

Intersection Sight Distance for Bicyclist Crossing an Uncontrolled Roadway from a Stop-Controlled Approach

Where a bikeway crosses an uncontrolled roadway (as illustrated in Figure 37), provide intersection sight distances per Table 23 to allow crossing bicyclists to judge adequate gaps in traffic.

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Figure 37 – Bicycle Intersection Sight Distance Crossing an Uncontrolled Roadway from a Stop-Controlled Minor Road

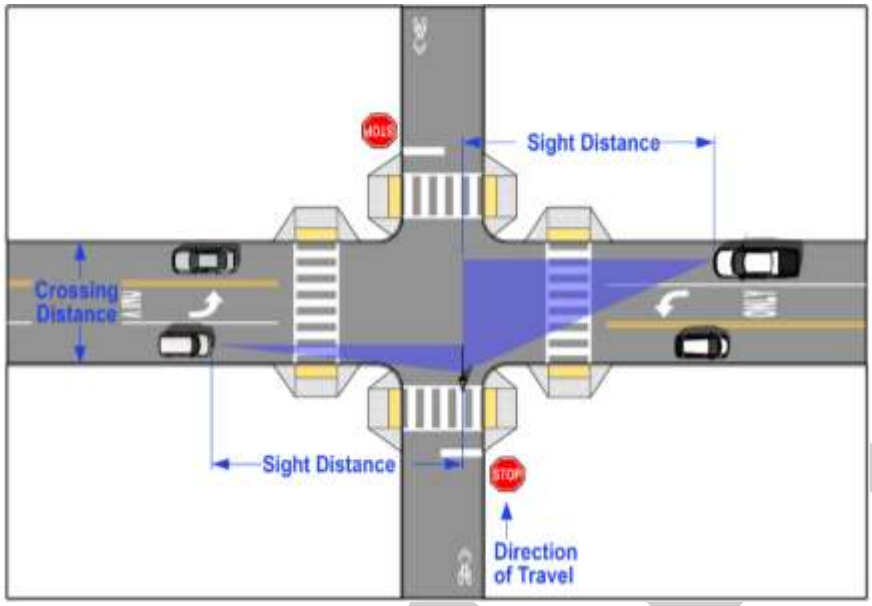


Table 23 – Bicycle Intersection Sight Distance Crossing an Uncontrolled Roadway from a Stop-Controlled Minor Road

Crossing Distance (feet)	85th % Operating Speed of Roadway to be Crossed (mph)								
	20	25	30	35	40	45	50	55	60
10	156	195	233	272	311	350	389	428	466
15	170	213	255	298	340	383	425	468	510
20	183	229	275	320	366	412	458	503	549
25	196	245	294	342	391	440	489	538	587
30	208	260	312	364	416	468	520	572	624
35	221	276	331	386	441	496	551	606	662
40	233	292	350	408	466	524	583	641	699
45	246	307	369	430	491	553	614	675	737
50	258	323	387	452	516	581	645	710	774
55	271	338	406	474	541	609	676	744	812
60	283	354	425	495	566	637	708	778	849

Assumptions:

- Bicycle reaction time: 1.5 seconds
- Bicycle acceleration: 2.5 feet/second^2
- Bicycle maximum speed: 8 mph
- Length of bicycle: 8 feet
- Grade −2% to +2%

Clear View Triangle for Turning Motorist Crossing a Separated Bicycle Lane or Shared-Used Pathway

Where not otherwise prohibited under SMC Section 16A.05.360, parking and other sight obstructions should be restricted near all intersections, driveways, and alley accesses where:

- A **right**-turning motorist crosses a separated bicycle lane or shared-use pathway
- A **left**-turning motorist crosses a contraflow separated bicycle lane, two-way separated bicycle lane, or shared-use pathway

A clear space along the separated bicycle lane should be provided as illustrated in Figure 38 and described in Table 24, measured upstream from the point of curvature of a turning motorist's effective turning radius.

Figure 38 – Separated Bicycle Lane Approach Clear Space

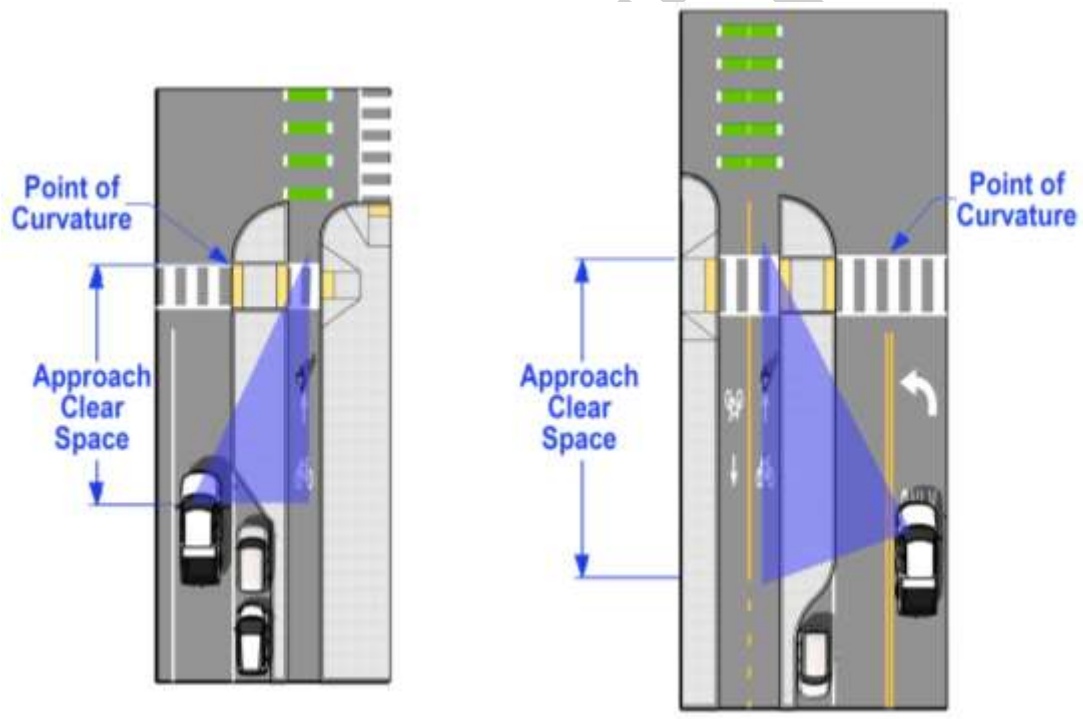


Table 24 – Separated Bicycle Lane Approach Clear Space

Effective Vehicle Turning Radius (feet)*	Vehicular Turning Speed (mph)	Recommended Approach Clear Space (feet)
< 18**	< 10	20
18	10	40
25	15	50
30	20	60
> 30	25	70

* Effective turning radius is dependent on the intersection corner geometry and the width of the receiving lane.
** This row applies to most low-volume driveways and alleys.
Assumptions:
- Bicycle speed 15 mph
- Bicycle speed approaching the intersection: 11 mph

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Clear View Triangle for Pedestrian Crossing of an Uncontrolled Separated Bicycle Lane Approach

Where pedestrian crossings of separated bicycle lanes are designated, a clear view triangle should be provided to allow pedestrians to judge gaps in approaching bicycle traffic and to allow bicyclists to yield and stop, as necessary. The clear view triangle should be provided along both sides of the separated bicycle lane, using the dimensions illustrated in Figure 39 and provided in Table 25.

Figure 39 – Clear View Triangle for a Pedestrian Crossing of an Uncontrolled Separated Bicycle Lane

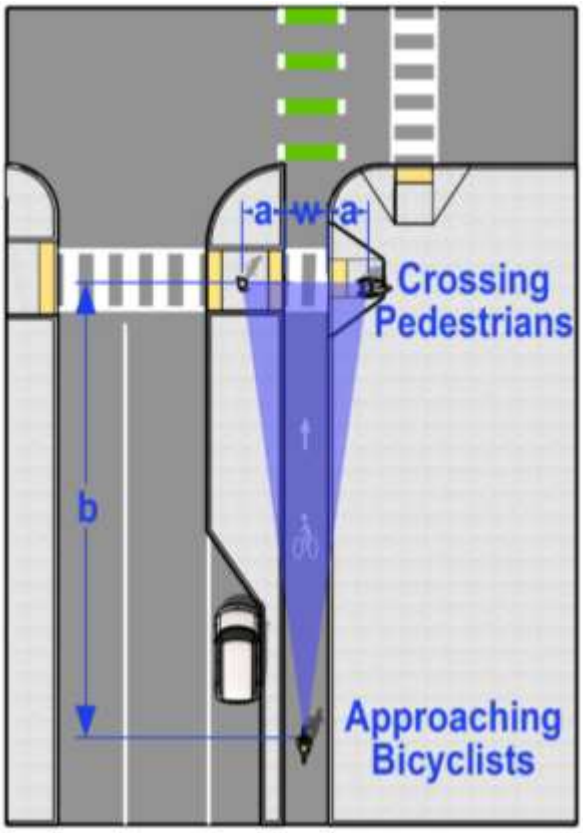


Table 25 – Clear View Triangle for a Pedestrian Crossing of an Uncontrolled Separated Bicycle Lane (SBL)

Width of SBL [W] (feet)	Length of clear view triangle along SBL [b] (feet)	Width of clear view triangle perpendicular to SBL, beyond SBL width [a] (feet)
4	98	6 Where a curb ramp is present, [a] should be at least the length between the curb line and the top of the curb ramp.
6	118	
8	138	
10	157	
12	177	

Assumptions:

- Bicycle speed (V): 20 mph
- Pedestrian speed (s_p): 3 feet/second
- Pedestrian reaction and stop time (t_s): 2 seconds

$$b = 1.47V\left(\frac{W}{s_p} + t_s\right)$$

$$a = s_p \times t_s$$

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3.14-6.2 Intersection Approaches with Right Turns Crossing Bicycle Lanes

Application

Apply this section where bicycle lanes (separated, buffered, or striped) approach intersections to the right of right-turn-only lanes or to the left of left-turn-only lanes on one-way streets.

- Shared-use pathways approaching intersections shall be designed as pedestrian crossings.

General Guidance

Continue the bicycle facility to the intersection, to the extent practicable.

- Select the preferred intersection approach configuration from Table 26 based on the turn lane type, bicycle lane type, and on-street parking presence.
  - If an analysis determines that the preferred option is infeasible, consider the secondary and tertiary options, if provided. These downgraded configurations may be used with City Engineer approval, as described in Section 3.14-3.4.
- When none of the configurations are feasible, the bicycle facility may be terminated in advance of the intersection to provide a shared lane, with City Engineer approval.
- For retrofit conditions on existing facilities, consider one or more of the following design strategies to maintain bicycle lane continuity to the intersection:
  - Remove on-street parking to provide adequate bicycle lane width and transition area.
  - Convert separate right-turn and through lanes to a shared through/right-turn lane where operationally acceptable.
  - Reduce motor vehicle lane widths to as low as the minimum dimensions identified in Table 1.

For all configurations described in this section:

- Per MUTCD Section 9E.02, a through bicycle lane shall not be positioned to the right of a right-turn-only lane or to the left of a left-turn-only lane, unless the bicycle lane is controlled by a traffic signal that displays bicycle signal indications (see Section 3.14-6.3.7).
- Bus-only lanes that allow general traffic right turns, including Business Access and Transit (BAT) lanes, may be considered as shared through/right-turn lanes.

Table 26 – Bicycle Lane Intersection Approach Configuration

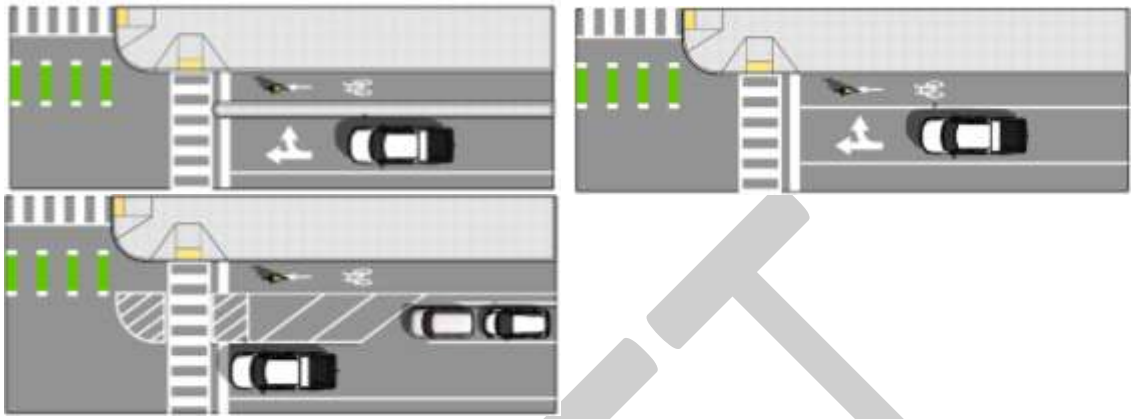
Turn Lane Type	Bicycle Lane Type	On-Street Parking	Preferred	Secondary	Tertiary
Shared Through/ Right-Turn Lanes	Separated	Any	Continuous transition (protected corner)	*N/A*	*N/A*
	Buffered or Striped	Yes	Bend-out	Continuous transition	*N/A*
		No	Continuous transition	*N/A*	*N/A*
Signalized Dedicated Right-Turn Lane	Separated	Any	Continuous transition (protected corner)	Lateral shift	*N/A*
	Buffered or Striped	Yes	Bend-out	Continuous transition	Lateral shift
		No	Continuous transition	Lateral shift	*N/A*
Unsignalized Dedicated Right-Turn Lane	Separated, Buffered, or Striped	Any	Lateral shift	*N/A*	*N/A*

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3.14-6.2.1 Continuous Transition

Continuous transition configurations maintain a striped, buffered, or separated bicycle lane through the intersection approach.



Application

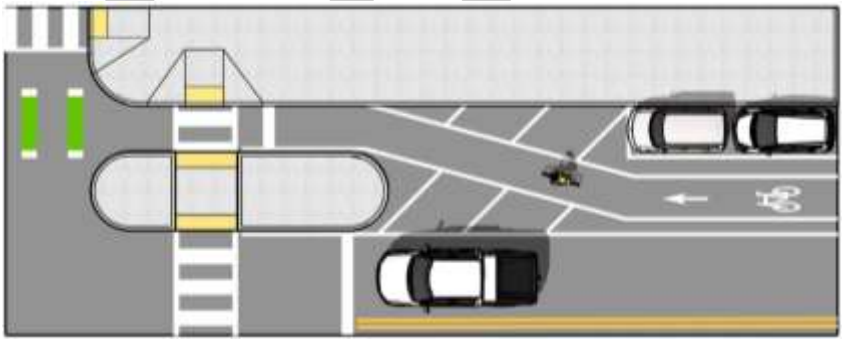
Continuous transition configurations shall not be used adjacent to right-turn-only lanes on unsignalized approaches.

Design Criteria

- If used adjacent to turn-only lane, a bicycle signal indication and exclusive phasing shall be provided per MUTCD Section 9E.02, and a right-turn-on-red restriction shall be posted.
- For separated bicycle lanes, terminate on-street parking and vertical separation materials greater than 2 feet in height prior to the intersection to establish clear view triangles per Section 3.14-5.2.4.

3.14-6.2.2 Bend-Out

Bend-out configurations offset a buffered or striped bicycle lane by eliminating on-street parking on the intersection approach and separating the bicycle lane from the adjacent vehicle lane using corner islands or striped buffers.



Application

- May be used on approaches where a striped or buffered bicycle lane is adjacent to an on-street parking lane.

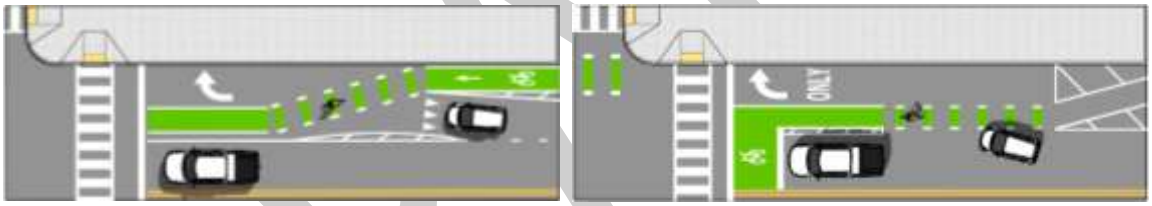
- Bend-out configurations shall not be used adjacent to right-turn-only lanes on unsignalized approaches.

Design Criteria

- If used adjacent to turn-only lane, a bicycle signal indication and exclusive phasing shall be provided per MUTCD Section 9E.02, and a right-turn-on-red restriction shall be posted.
- Bend out the bicycle facility using the maximum taper rates described in Section 3.14-4.5.
- Eliminate parking between the start of the taper and the intersection.
- Provide an island or striped buffer on the approach to the intersection, extending to the intersection and reinforcing the bicycle lane setback with vertical objects (which may be mountable, if needed).
  - Where a pedestrian crossing is present and the island is at least 6 feet wide, provide a pedestrian refuge island.
  - A striped island may be used on roadways with speed limits of 30 mph or lower or where required to accommodate design vehicle movements.

3.14-6.2.3 Lateral Shift

Lateral shift configurations transition a bicycle lane through a mixing zone, where motor vehicle and bicycle paths cross, to a small segment of bicycle lane between an exclusive turn lane and a through lane.



Application

Lateral shift configurations may be used for bicycle lanes that are adjacent to the curb or located between a parking lane and the adjacent vehicle lane.

Design Criteria

- The mixing zone should be at least 50 feet long.
- For separated bicycle lanes, terminate on-street parking and vertical separation materials greater than 2 feet in height at least 50 feet upstream of the mixing zone.
- The bicycle lane segment downstream of the mixing zone should be at least 25 feet long.
- Bicycle conflict markings should be used in the mixing zone (see Section 3.14-9.2.4).
- When a street buffer is present:
  - The buffer should be tapered approaching the merge zone, increasing the angle between the bicyclists and motorists at the merge point.
  - Where feasible, a motorist yielding area at least 20 feet long should be established prior to the mixing zone.
- Lateral shift configurations shall be striped and signed per the MUTCD.
- Bicycle facility taper rates should be per Section 3.14-4.5.

3.14-6.2.4 Shared Lane

Shared-lane configurations terminate the bicycle lane in advance of a turn lane and transition bicyclists into a shared operating space with turning vehicles.



Application

- At signalized intersections, per MUTCD Section 9E.05, this configuation shall only be applied where the vehicle turning movement is always permitted to proceed simultaneously with the adjacent through movement.
- Leading right-turn phases shall not be used in shared-lane configurations.

Design Criteria

- Where a shared-lane intersection approach is used in conjunction with a sidewalk-level separated bicycle lane, a ramp should be provided at least 25 feet in advance of the mixing zone to transition the bicycle facility to street level, as described in Section 3.14-7.2. If the sidewalk-level facility resumes after the intersection, a ramp should be provided approximately 25 feet downstream from the intersection to transition the bicycle facility back to sidewalk level.
- Shared-lane intersection approaches shall be striped and signed per the MUTCD.

3.14-6.3 Optional Bicycle Intersection Treatments

This section describes optional bicycle-friendly treatments that may be provided at intersections.

3.14-6.3.1 Intersection Bicycle Box

An intersection bicycle box is a designated bicycle storage area located at the approach to a signalized intersection, between the stop line and the crosswalk.

Application

Intersection bicycle boxes may be used where it is desired to position bicyclists ahead of queued motor vehicles during the red signal interval to:

- Mitigate conflicts between motorists and bicyclists at the beginning of the green signal interval by improving motorist visibility.
- Facilitate left turns by bicyclists.
- Allow a larger number of bicyclists to proceed through the intersection during a green signal interval.

Design Criteria

Design intersection bicycle boxes in accordance with the MUTCD and the following criteria:

- Provide a minimum 50-foot bicycle lane approach to the bicycle box.

- Provide green-colored pavement within the full limits of the bicycle box and within the bicycle lane approach for a minimum of 20 feet upstream of the box.
- Install a No Turn on Red sign (MUTCD R10-11 series) on approaches where traffic might turn across the bicycle box during the red signal interval.

Figure 40 – Intersection Bicycle Box



3.14-6.3.2 Two-Stage Bicycle Turn Box

A two-stage bicycle turn box is a marked area at an intersection that allows bicyclists to make a left turn (or right turn from a left-side lane) in two separate steps without merging across vehicle traffic lanes.

Application

Two-stage bicycle turn boxes support bicyclists making left-turn movements from the right side of the roadway or right-turn movements from the left side of the roadway. They may be used where

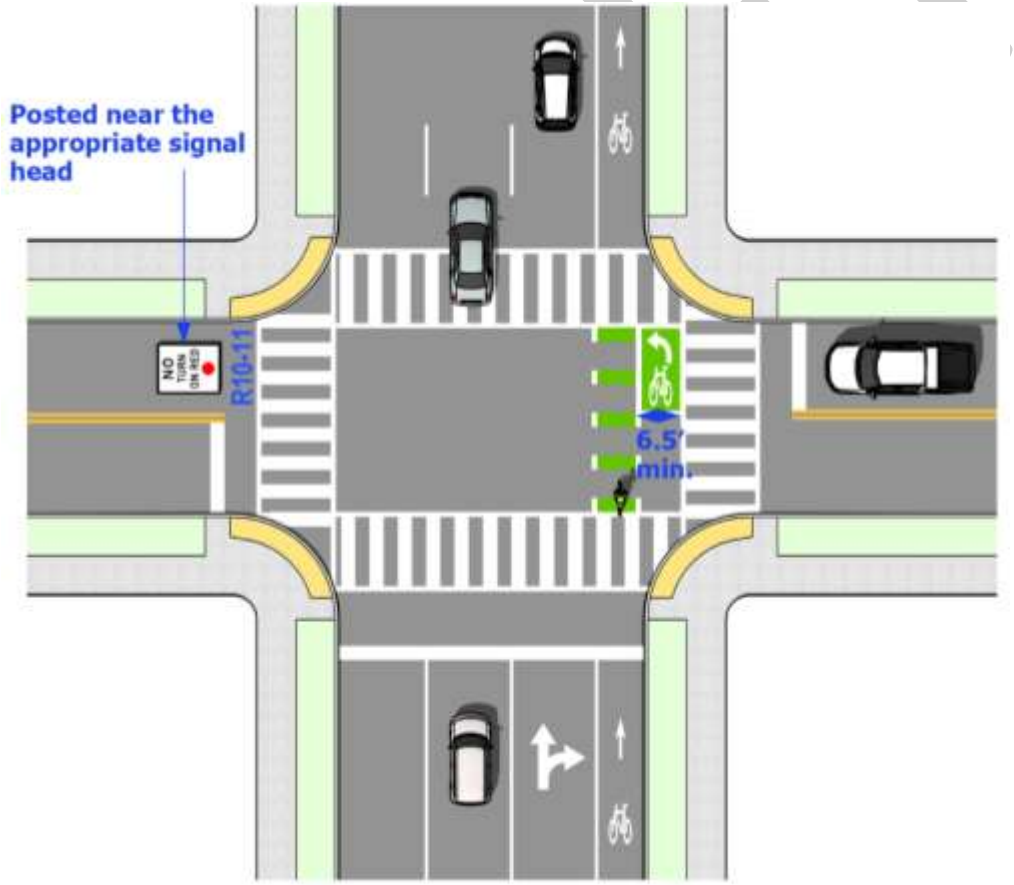
bicyclists would otherwise need to weave across motor vehicle lanes, cross multiple travel lanes, or merge across higher-speed or higher-volume traffic to complete a turn. They may be used with intersection bicycle boxes on the same intersection approach when both treatments support distinct bicycle movements.

Design Criteria

Design in accordance with the MUTCD and the following supplemental criteria:

- Provide green-colored pavement within the full limits of the two-stage turn box.
- Two-stage turn boxes should be a minimum of 6.5 feet long in the direction bicyclists are expected to depart the box.
- Bicyclists in the turn box should be clearly visible to motorists and outside of conflicting motor vehicle paths.
- Install a No Turn on Red sign (MUTCD R10-11 series) on approaches where the two-stage turn box is not outside of the path of right-turning traffic.

Figure 41 – Two-Stage Bicycle Turn Box



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3.14-6.3.3 Diverters

Diverters are volume-management treatments applied at intersections to restrict specific motor vehicle movements while maintaining bicycle permeability.

Application

Diverters may be used to support a neighborhood greenway.

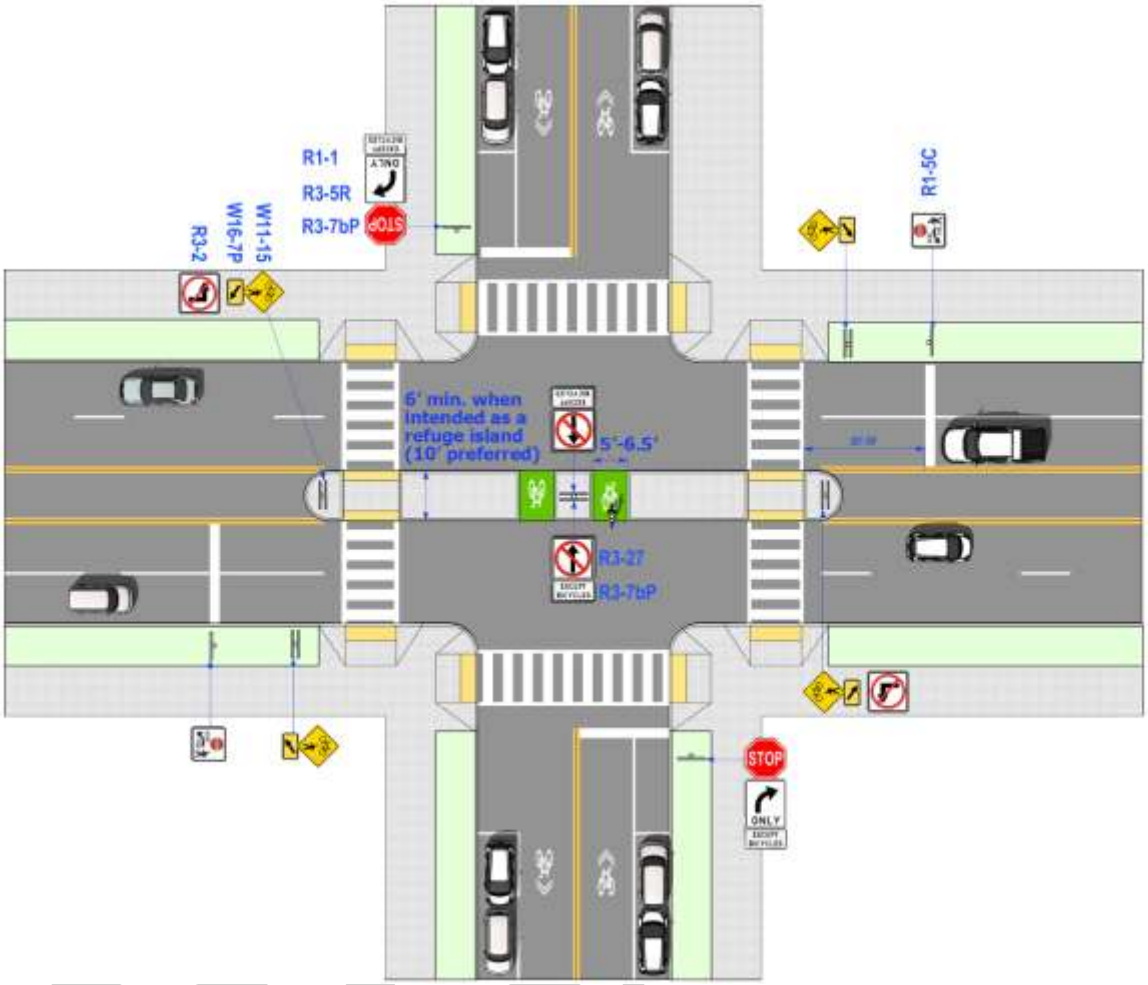
General Guidance

Bicycle facility consideration for diverters (Figure 42 through Figure 44) should include the following:

- Openings for bicycle passage should be 5 to 6.5 feet wide.
  - The width of the opening may be increased to a maximum of 8 feet if high volumes of bicyclists are expected during crossings.
  - Provide separate openings for each direction of bicycle travel and for each pedestrian crossing, where space is available to do so.
- Post movement prohibition (MUTCD R3-1, R3-2, or R3-27) or DO NOT ENTER (R5-1) signs accompanied by EXCEPT BICYCLES (MUTCD R3-7bP) plaques, as appropriate.
- As needed, accommodate emergency vehicles by providing cut-through slots matching emergency vehicle wheelbases or by lowering curb heights.
- Where the median is intended to support two-stage crossings, it should have a minimum 6-foot depth in the direction of the bicycle crossing.
  - A 10-foot width is recommended to accommodate a bicycle with a trailer or higher volumes of bicyclists.
  - Where bicyclists and pedestrians can cross the roadway in a single stage, hardened centerlines or medians narrower than 6 feet may be used.
- For diagonal diverters, provide openings for bicycle passage on either side of the center island. Additional openings may be provided between the corner island the curb to facilitate right-turn movements by bicyclists.
- Coordinate with City Engineering Services to ensure that diverter designs accommodate stormwater drainage needs.

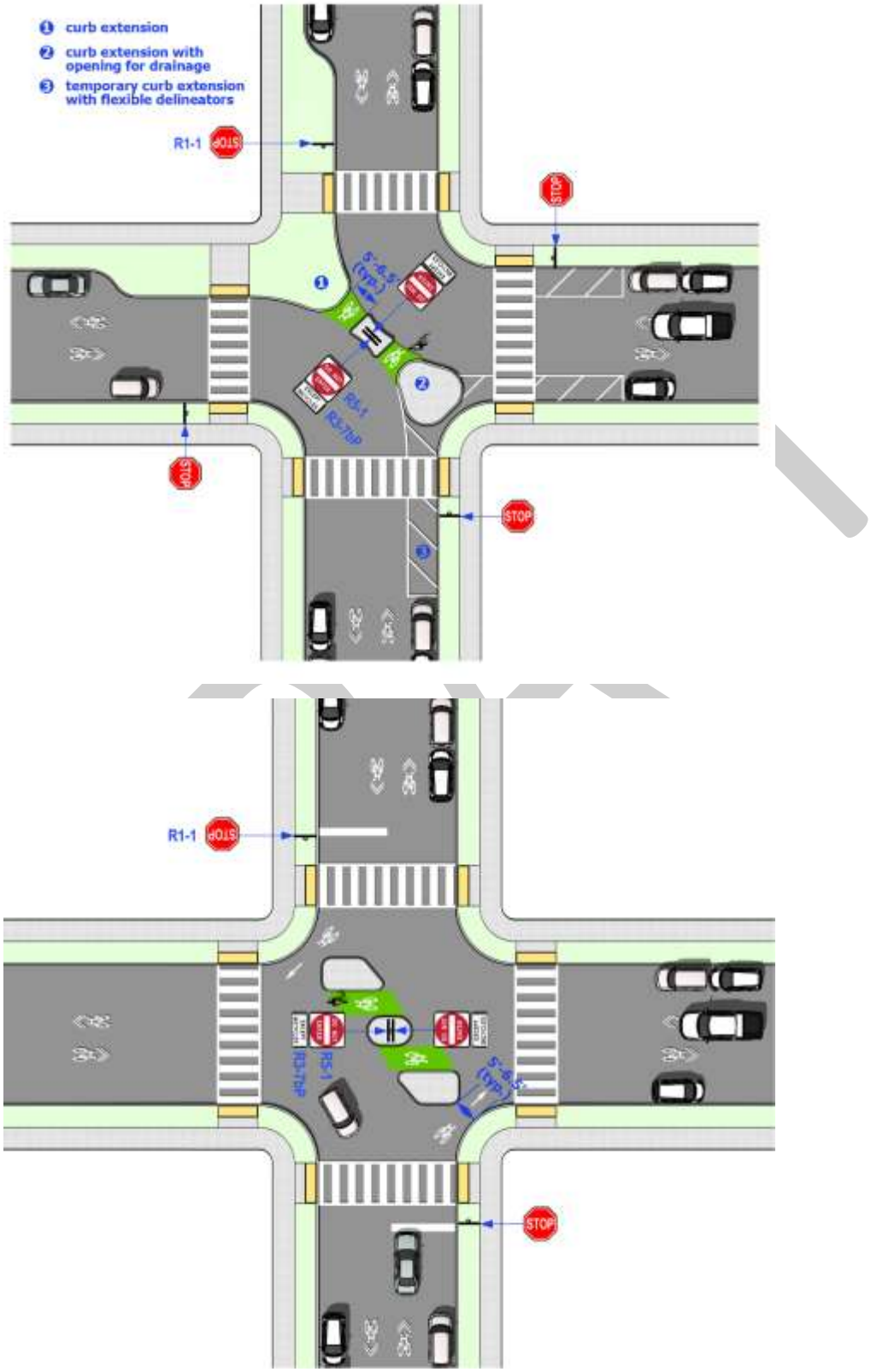
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Figure 42 – Median Diverter



Example shown is an uncontrolled intersection. See Section 3.14-6.4 for considerations for uncontrolled crossing countermeasures.

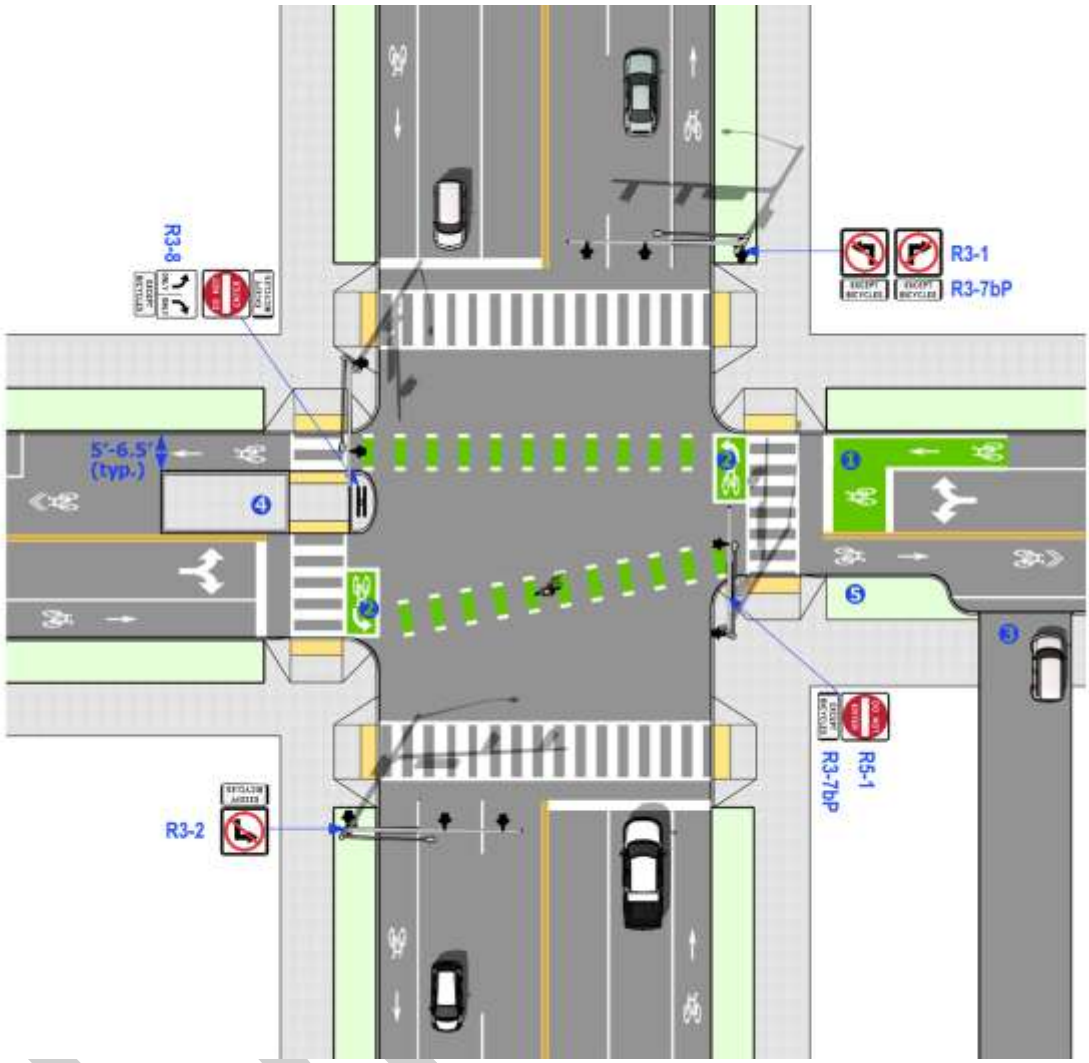
Figure 43 – Diagonal Diverter Configurations



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Figure 44 – Forced Turn Diverter



1	Intersection bicycle box (see Section 3.14-6.3.1)
2	Two-stage bicycle turn box (see Section 3.14-6.3.2)
3	Two-way street operation for motorists terminates at the nearest intersection, driveway, alley, or turnaround
4	Raised island
5	Curb extension

3.14-6.3.4 Advance Bicycle Stop Bars

Advance bicycle stop bars allow bicyclists to wait in locations where motorists can see them and to enter the intersection before turning vehicles when the signal turns green.

Application

Advance bicycle stop bars may be used on striped, buffered, and separated bicycle lane approaches to signalized intersections, particularly where heavy right-turn motorized vehicle volumes conflict with concurrent bicycle through movements.

Design Criteria

- The motorized vehicle stop bar may be recessed and/or the bicycle stop bar placed downstream of an existing vehicle stop bar, subject to the following provisions:
  - The advance bicycle stop bar should be placed 6 feet or more ahead of the vehicle stop bar.
  - The advance bicycle stop bar should be recessed 4 feet from the marked crosswalk, if present.
  - An advance bicycle stop bar should not place the bicycle facility in the path of an off-tracking accommodated vehicle.
- At the intersection of two separated bicycle lanes, an advance bicycle stop bar may be placed downstream of the intersecting separated bicycle lane—within the intersecting separated bicycle lane's street buffer—to create a forward bicycle queuing area as part of a protected intersection design (see Section 3.14-6.3.6).

3.14-6.3.5 Raised Intersections and Raised Crossings

Raised intersections raise the entire roadway to sidewalk level at the intersection, while raised crossings raise just the pedestrian and/or bicycle paths through the intersection to sidewalk level.

Application

Where a bicycle facility interfaces with an existing raised intersection or where a bicycle facility is being built alongside a raised intersection or crossing.

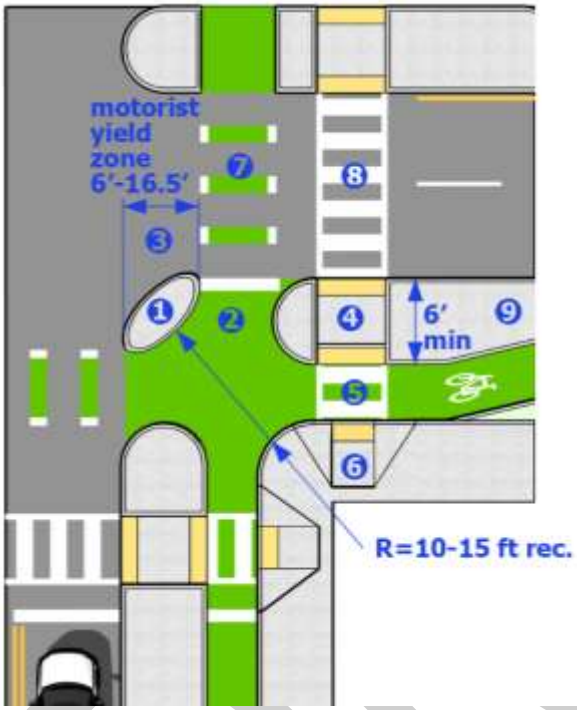
Design Criteria

- Maintain continuity of the surface materials, color, and texture of the bicycle facility through the crossing.
- Provide bicycle conflict markings over the extent of the raised intersection
  - Align markings when parallel to longitudinal crosswalks, and mark normally otherwise
- Refer to Spokane Standard Details when constructing a new raised intersection or crossing alongside a bicycle facility while also considering the following:
  - Maintain a level surface within the width of the bicycle facility across the raised intersection or crossing.
  - The approach and departure slope should be 7–8% relative to the existing slope.
  - To assist pedestrians with vision disabilities, provide appropriate tactile walking surface indicators, such as trapezoidal surface, to separate a bicycle facility located at sidewalk level from an adjacent sidewalk, such as at the top of a T-intersection.

3.14-6.3.6 Protected Intersections

A protected intersection provides dedicated paths through an intersection for bicyclists using corner islands and setback crossings. It is used at intersections to reduce bicycle conflicts with turning vehicles and is particularly suited for intersections where separated bicycle lanes are provided on both streets. Figure 45 shows typical elements of a protected intersection design. Additional guidance for protected intersection designs can be found in the NACTO *Urban Bikeway Design Guide*.

Figure 45 – Protected Intersection Components



1	Corner island
2	Forward bicycle queueing area
3	Bikeway setback
4	Pedestrian refuge island
5	Pedestrian crossing of separated bicycle lane
6	Pedestrian curb ramp
7	Bicycle crossing of travel lanes
8	Pedestrian crossing of travel lanes
9	Street buffer (see Section 3.14-5.2)

Corner Island

The corner island physically separates the bicycle lanes from the adjacent vehicle lanes up to the intersection crossing point.

- Use a standard vertical curb on the vehicle side and a sloping curb on the bicycle facility side.
- On the vehicle side, use the smallest feasible curb radius that accommodates the design vehicle.
- Where design vehicle (see Section 3.11-1) paths require, consider supplementing the corner island with a mountable truck apron. In such cases, locate the bicycle stop bar behind the mountable portion of the island

Forward Bicycle Queuing Area

The forward bicycle queuing area is a space where bicyclists can wait for a green indication at the point of intersection crossing, increasing their visibility to turning motorists and reducing their crossing distance.

- A forward bicycle queuing area may be provided where the street buffer for the intersecting separated bicycle lane is at least 6 feet wide.
- Where the street buffer is less than 6 feet wide, a stop bar should be provided upstream of the pedestrian crossing (where present) or intersecting bicycle lane.
- Place an advance bicycle stop bar downstream of the intersecting separated bicycle lane, within the street buffer, to create a forward bicycle queueing area.
- On high-volume bicycle facilities (per Section 3.14-2), provide additional queueing space with a larger forward bicycle queueing area.

Bikeway Setback

A bikeway setback separates a bicycle crossing from a parallel motor vehicle travel lane, making a bicyclist more visible.

- The setback should be 6 to 16.5 feet deep.
  - Setbacks of 20 feet or more may be appropriate to allow turning motorists to yield out of the through vehicle path. Where setbacks greater than 16.5 feet are used, provide a raised crossing and/or hardened centerline to reduce turning speeds and improve crossing legibility.

Pedestrian Crossing

- Pedestrian crossings of the bicycle lane should:
  - Be marked with crosswalk markings in the bicycle lane, per the MUTCD.
  - Be aligned with the crosswalk of motorist travel lanes.
  - Have detectable warning surfaces (truncated domes) at the entries to the crossing.
- The bicycle and pedestrian crossings should be separate but parallel and in close proximity to one another to consolidate conflicts with motorists.
- Where the street buffer of the perpendicular separated bicycle lane is 6 feet or greater in width, a pedestrian refuge island should be provided in the buffer.

Constrained Conditions

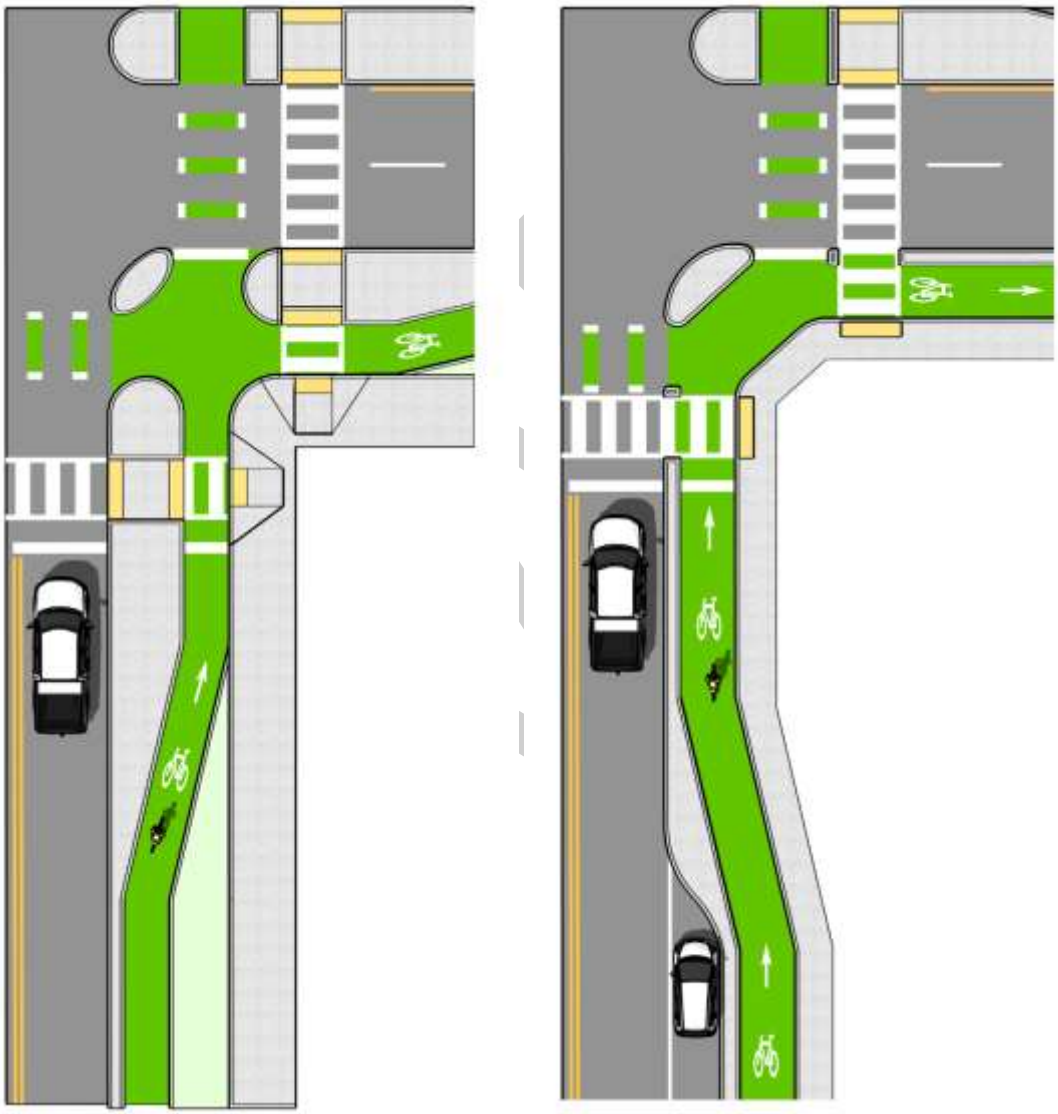
Where achieving the above design criteria for a protected intersection is deemed infeasible, apply the following mitigations in order of priority:

1. Reduce the sidewalk buffer to a minimum of 1 foot, maintaining a detectable edge between the bicycle lane and the sidewalk.
2. Use a bend-out intersection approach to provide a wider corner island and bikeway setback where the separated bicycle lane street buffer is narrow, as shown in Figure 46.
3. A bikeway setback may be achieved by deflecting the bikeway behind the corner island, as shown in the bend-in configuration in Figure 46.

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4. Minimize the street buffer and bikeway setback while maintaining vertical separation and the corner island.
   - This mitigation should not be used where conflicting vehicle turning movements are given concurrent green indications with the bicycle lane.
   - The pedestrian refuge island shall not contain detectable warning surfaces if reduced to less than 6 feet wide.

Figure 46 – Bend-Out and Bend-In Protected Intersection Configurations



Bend-Out Bend-In

3.14-6.3.7 Bicycle Signal Faces

A bicycle signal is a traffic control device that uses bicycle-specific red, yellow, and green indications to direct bicyclist movements.

Application

Bicycle signal heads are required by the MUTCD when a bicycle lane is located to the right of a right-turn lane, or to the left of a left-turn lane on a one-way street. They can also be used to provide leading bicycle intervals and to facilitate exclusive bicycle phases serving movements that otherwise would be prohibited (for example, when a bikeway alignment crosses an intersection diagonally). Refer to the MUTCD for other requirements related to bicycle signals.

Additionally, bicycle signal heads may be used when it is necessary or desirable to:

- Clearly communicate bicycle-specific signal indications.
- Provide signal phasing that is separate from motor vehicle movements, such as where a separated bicycle lane is located outside of a turn-only lane.
- Provide a leading bicycle interval.
- Provide a visible signal indication for counterflow bicycle facilities.

Alternatively, a pedestrian signal face may be used to direct bicycle movements:

- Along shared-use pathways.
- Along separated bicycle lanes where vehicle signals are not visible to bicyclists.
- Where pedestrian and bicycle movements can operate together.
- Where bicyclists may use a leading pedestrian interval.
- Where a signal indication is needed for counterflow bicycle movements.

Design Criteria

Where a pedestrian signal head is used to direct bicycle movements, it should be accompanied by a Bicycles Use Ped Signal (MUTCD R9-5) sign.

When the primary bicycle signal face is located 120 feet or more away from the stop line, an additional near-side bicycle signal shall be provided, per MUTCD Section 4H.08.

3.14-6.3.8 Bicycle Detection

Bicycle detection is the process of automatically or manually sensing the presence of a bicyclist, using inductive loops, video cameras, pushbuttons, or other sensing technologies.

Application

Used at crossings with rapid rectangular flashing beacons, pedestrian hybrid beacons, or other active warning devices, as well as at intersections with actuated traffic signals.

General Guidance

As required by State law, RCW 47.36.025, new construction or upgrade of detection equipment, including bicycle inductive loops, video, microwave, radar, or other passive detection systems, should be accompanied by pavement markings that indicate the location where a bicycle should be located to be detected.

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Detectors should be located or oriented to sense bicyclists that are stopped at the stop bar and are within intersection bicycle boxes and two-stage turn boxes, where provided.

An advance detector may be provided to trigger a green extension or call a phase as bicyclists approach the intersection. If used, advance detectors should detect bicyclists approximately 100 feet upstream of the stop bar.

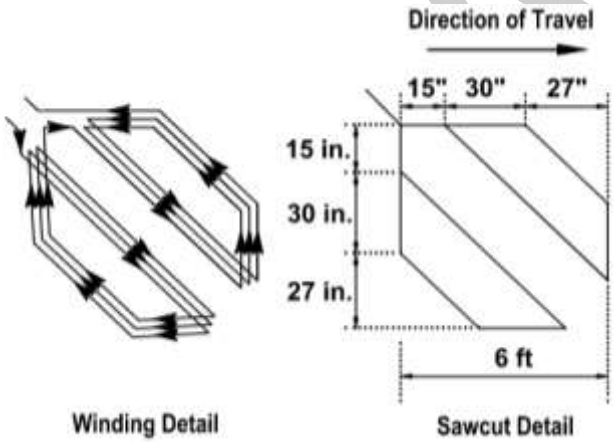
Markings consistent with Standard Plan XYZ should be placed when bicyclists are required to stop in specific locations to be detected.

Inductive Loops

Inductive loop detection uses a coil of wire embedded in the roadway to create a magnetic field which can be used to detect metal within a bicycle.

- The sensitivity of the inductive loops should provide detection for bicycles. Where existing inductive loops are used for detecting motor vehicles and bicyclists are expected to operate in shared lanes, sensitivity will likely need to be adjusted.
- Type D quadrupole inductive loops, as illustrated in Figure 47, should be used for striped bicycle lanes, due to their ability to reject detection of vehicles in the adjacent travel lane.

Figure 47 – Type D Quadrupole Inductive Loop Detection Detail (via AASHTO *Guide for the Development of Bicycle Facilities, 5th Edition*)



Video Detection and Microwave (Radar) Systems

Video detection, microwave, and radar systems use sensors aimed at an intersection approach to detect bicyclists and/or other road users.

Used for retrofit projects where detection systems for motor vehicles are not already in place; or at intersections where such systems are being used for motor vehicles.

- Video detection may not be appropriate where there is little streetlighting.
- Video and microwave (radar) detection may perform poorly in foggy or snowy conditions.
- Place to avoid effects of sun glare and shadows.

Pushbuttons

Pushbuttons are manually activated buttons and are used to supplement other detection types or in locations where it is desired for a bicyclist to be detected at a crossing but not a motorist, for example at neighborhood greenway crossings of collector or arterial roadways.

- Pushbuttons should be placed where bicyclists can actuate the button without dismounting.
  - For on-roadway bicycle facilities, the pushbutton should be no more than 10 inches from the face of curb.
  - A bicycle ramp (see Section 3.14-7.2) may be provided to allow bicycle users to access a pushbutton provided for a sidewalk or shared-use pathway.
- Pushbutton should be located at least 3 feet from the roadway to be crossed, to ensure bicyclists' front wheels are clear of the roadway when stopped.
- Pushbutton poles should be positioned out of the path of errant vehicles or use breakaway designs, per the AASHTO *Roadside Design Guide*.
- Bicycle pushbuttons should be accompanied by a supplemental sign (such as an MUTCD R10-24, R10-25, or R10-26) explaining their purpose. The sign should be mounted directly above or integrated into the button, oriented in the same direction as the bicycle crossing.

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3.14-6.4 Traffic Control Devices for Unsignalized Intersections

Where a bicycle facility crosses an intersection with a collector or arterial roadway and approaching motorists are not controlled by yield or stop signs or traffic signals, it may be appropriate to install warning or traffic control specifically to support crossings by bicyclists.

- The type of traffic control and warning used at an intersection should be the least restrictive that provides appropriate levels of safety and efficiency for all road users, per the MUTCD.
- Use Table 27 to guide the selection of a control and warning type for intersections with collector and arterial roadways along bikeways.

Table 27 – Uncontrolled Crossing Countermeasure Selection

Roadway Type (combined lanes in both directions of travel, raised medians ≥ 8 feet wide)	Vehicle ADT											
	< 9,000			9,000 – 12,000			12,000 – 15,000			> 15,000		
	Speed Limit											
	≤30	35	≥40[1]	≤30	35	≥40*	≤30	35	≥40	≤30	35	≥40
2 lanes	P	P	A	P	P	A	P	P	R	P	A	R
3 lanes with raised median ≥ 6 feet wide	P	P	A	P	P	A	P	A	R	A	A	R
3 lanes without raised median	P	P	A	P	A	A	A	R	R	A	R	R
4 lanes with raised median ≥ 6 feet wide	P	P	A	P	A	A	A	R	R	R	R	R
4+ lanes without raised median	P	A	R	A	A	A	R	R	R	R	R	R

* Where the speed limit exceeds 40 mph, a red indication should be considered.

Legend:

P	Stop control with **passive** warning, see Section 3.14-6.4.1.
A	Stop control with **active** warning, see Section 3.14-6.4.2.
R	**Red** indication (see Section 3.14-6.3.7) or grade separation.

3.14-6.4.1 Passive Warning

Passive warning devices include **static signs and markings**, such as crossing markings and warning signs.

- Provide bicycle conflict markings as described in Section 3.14-9.2.4.
- Provide warning signs for bicycle crossings (MUTCD W11-1 or W11-15) as described in the MUTCD.
- When providing the minimum sight triangles described in Section 3.14-6.1 is infeasible, install advance crossing warning signs (MUTCD W11-1 or W11-15) on motor vehicle approaches as described in the MUTCD.

3.14-6.4.2 Active Warning

Active warning devices include traffic control devices triggered by bicyclist detection, such as warning beacons or rectangular rapid-flashing beacons.

- Design of active warning devices should follow applicable guidance in the MUTCD.
  - Detection for bicyclists should be provided as described in Section 3.14-6.3.8.
  - When used on streets with operating speeds over 40 mph and with four or more lanes, additional beacons should be mounted in the median or overhead.

3.14-6.4.3 Red Indication

Red indications include traffic control signals and pedestrian hybrid beacons (PHBs). The use of red indications for the purposes of bikeway crossings should be limited to locations where warning devices alone do not provide adequate crossing opportunities for bicyclists[1]. A red indication should be considered at locations where any of the following conditions occur:

- MUTCD traffic signal warrants or PHB guidelines are met.
  - Bicycles may be considered pedestrians or vehicles. Warrant evaluation may rely on estimated future demand because the lack of a signal may be suppressing the volume of pedestrians and bicyclists crossing at a given location.
- Sight distance is restricted and cannot be improved due to site conditions.
- 85th percentile motor vehicle approach speeds exceed 40 mph.
- There are more than 3 lanes on the crossing street.
- The frequency of crossing opportunities is less than the practical minimum[1].
- The crash history or an engineering study indicate that a red indication could mitigate existing or potential crashes.

Design guidance for bicycle signal faces is provided in Section 3.14-6.3.7. The MUTCD provides design guidance for bicycle signals and PHBs.

3.14-6.5 Non-Standard Intersections

3.14-6.5.1 Roundabouts

See Section 3.11-5 for general guidance on roundabouts. Refer to the WSDOT *Design Manual*, Section 1320.05, and *NCHRP Report 1043: Guide for Roundabouts*, Section 10.4, for guidance on bicycle facility design at roundabouts.

Bicyclists may proceed as vehicles within the roundabout's circulatory roadway or, when provided, may use a sidewalk-level separated bicycle lane or shared-use pathway outside the roundabout, crossing the intersection legs as a pedestrian.

- Striped or buffered bicycle lanes shall not be located within the circulatory roadway of a roundabout, per the MUTCD.
- A consistent bicycle facility type should be maintained around the entire roundabout.
- Where a bicycle lane (striped, buffered, or separated) exists on the intersection approach, sidewalk-level separated bicycle lanes or shared-use pathways should be provided.
  - Bicycle ramps (see Section 3.14-7.2) should be provided to transition between street-level and sidewalk-level bicycle facilities.

[1] A crossing opportunity is created when motorists yield to a crossing bicyclist or when there is a sufficient gap in traffic for a bicyclist to make a crossing. The recommended frequency of crossing opportunities is ≥ 120 opportunities per hour, with a practical minimum of 60 crossings per hour.

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  - Appropriate tactile walking surface indicators shall be provided to guide pedestrians with vision disabilities.
    - Provide tactile warning delineators to separate sidewalk-level bicycle and pedestrian facilities.
    - Provide tactile directional indicators at the tops of bicycle ramps to guide pedestrians with disabilities toward the continuation of the pedestrian facility.
- In low-volume, low-speed situations, such as in residential areas, where there is insufficient space to accommodate bicycles around the outside of the roundabout, bicycle lanes may be terminated in advance of a roundabout, placing bicyclists in a shared lane through the roundabout.

3.14-6.5.2 Offset Intersections

Offset intersections occur where there is discontinuity in the street grid, resulting in a conventional four-legged intersection being replaced by two offset three-legged intersections. Design options include the following:

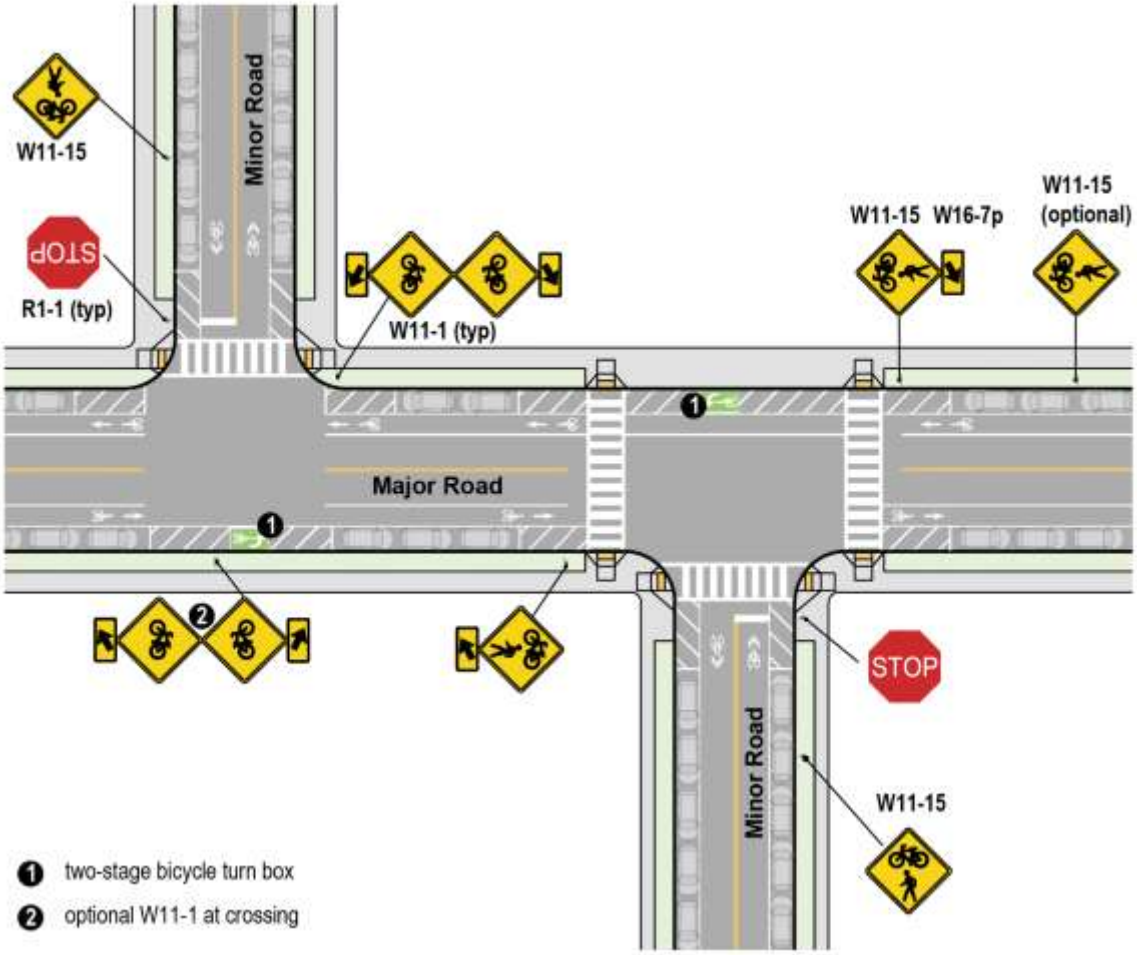
Bicycle Lanes with Two-Stage Bicycle Turn Boxes

This option provides two one-way bicycle lanes along opposite sides of the roadway being crossed. This configuration is appropriate where there are existing or planned bicycle lanes on the major roadway, or where bicycle lanes are the preferred treatment for the major roadway conditions.

- Select the bicycle lane type (striped, buffered, or separated) per Section 3.14-3.
- Provide two-stage bicycle turn boxes (see Section 3.14-6.3.2) on the major roadway aligned with the bicycle facilities on the minor roadway.
  - Space for the turn box may be created by restricting on-street parking through the intersection or by recessing the curb.
- Provide conflict striping across the major roadway (see Section 3.14-9.2.4).
- If warning devices or signals requiring bicyclist activation are provided, provide detection (see Section 3.14-6.3.8) for bicyclists positioned in the turn box.

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Figure 48 – Offset Shared Lane Intersection Using Bicycle Lanes and Two-Stage Bicycle Turn Boxes (via AASHTO *Guide for the Development of Bicycle Facilities, 5th Edition*)



Two-Way Separated Bicycle Lane or Shared-Use Pathway Connection

This option provides a two-way bicycle facility on one side of the roadway being crossed. This configuration is most appropriate where:

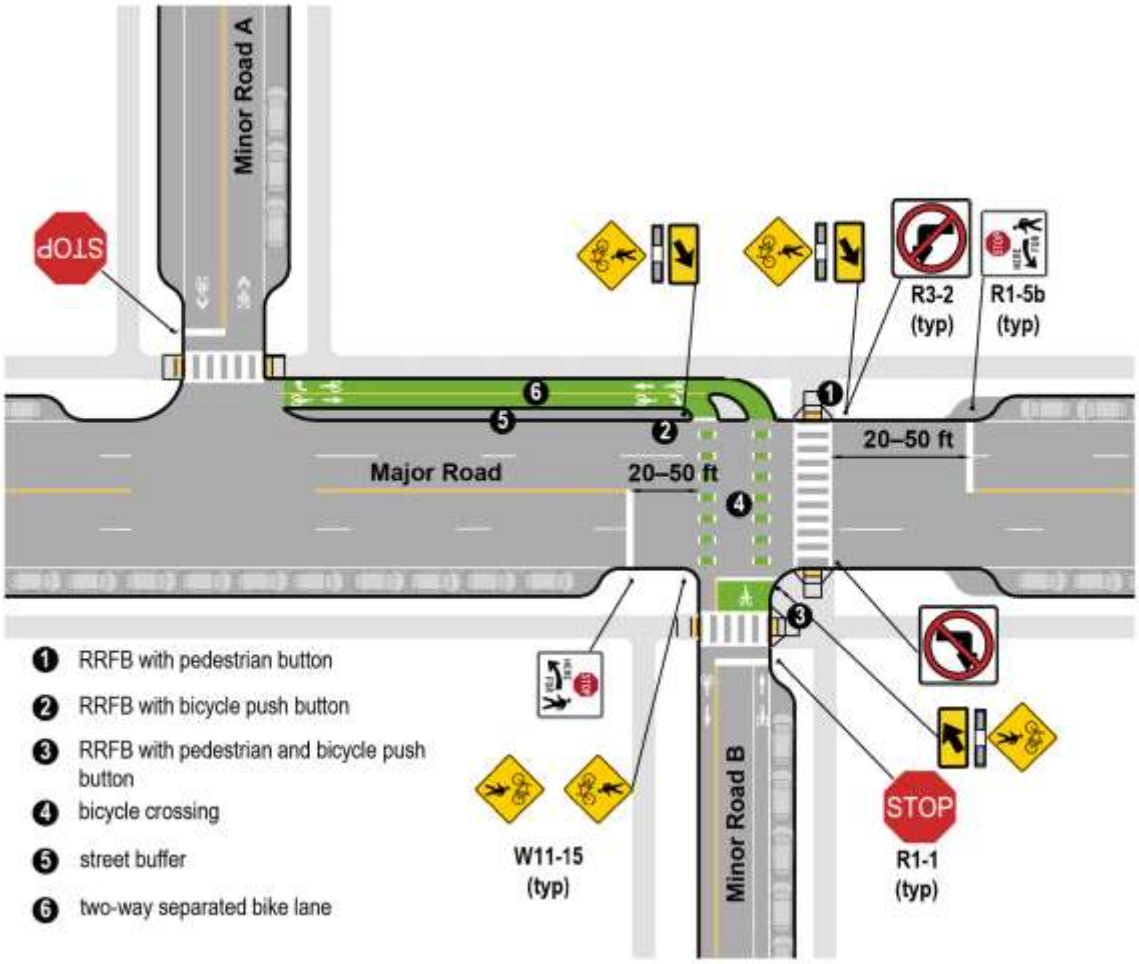
- Bicyclist-activated warning devices or signals are provided to support bicyclist crossings, as crossings are consolidated to a single location.
- Separated bicycle lanes or shared-use pathways are the preferred treatment for the major roadway conditions.
- Providing two one-way bicycle lanes is infeasible due to constrained right-of-way.

When designing this configuration:

- Align the major roadway crossing with the minor roadway intersection at which the bicyclist-activated warning device or signal is provided.
  - Provide conflict striping at roadway crossings (see Section 3.14-9.2.4).

- Where a two-way sidewalk-level separated bicycle lane is used, provide tactile warning delineators between the bicycle facility from the sidewalk to guide pedestrians with vision disabilities.
- Where the major roadway is multi-lane, provide a stop bar on the major roadway recessed 20-50 feet from the crossing.

Figure 49 – Offset Shared Lane Intersection Using Two-Way Separated Bicycle Lane (via AASHTO *Guide for the Development of Bicycle Facilities, 5th Edition*)



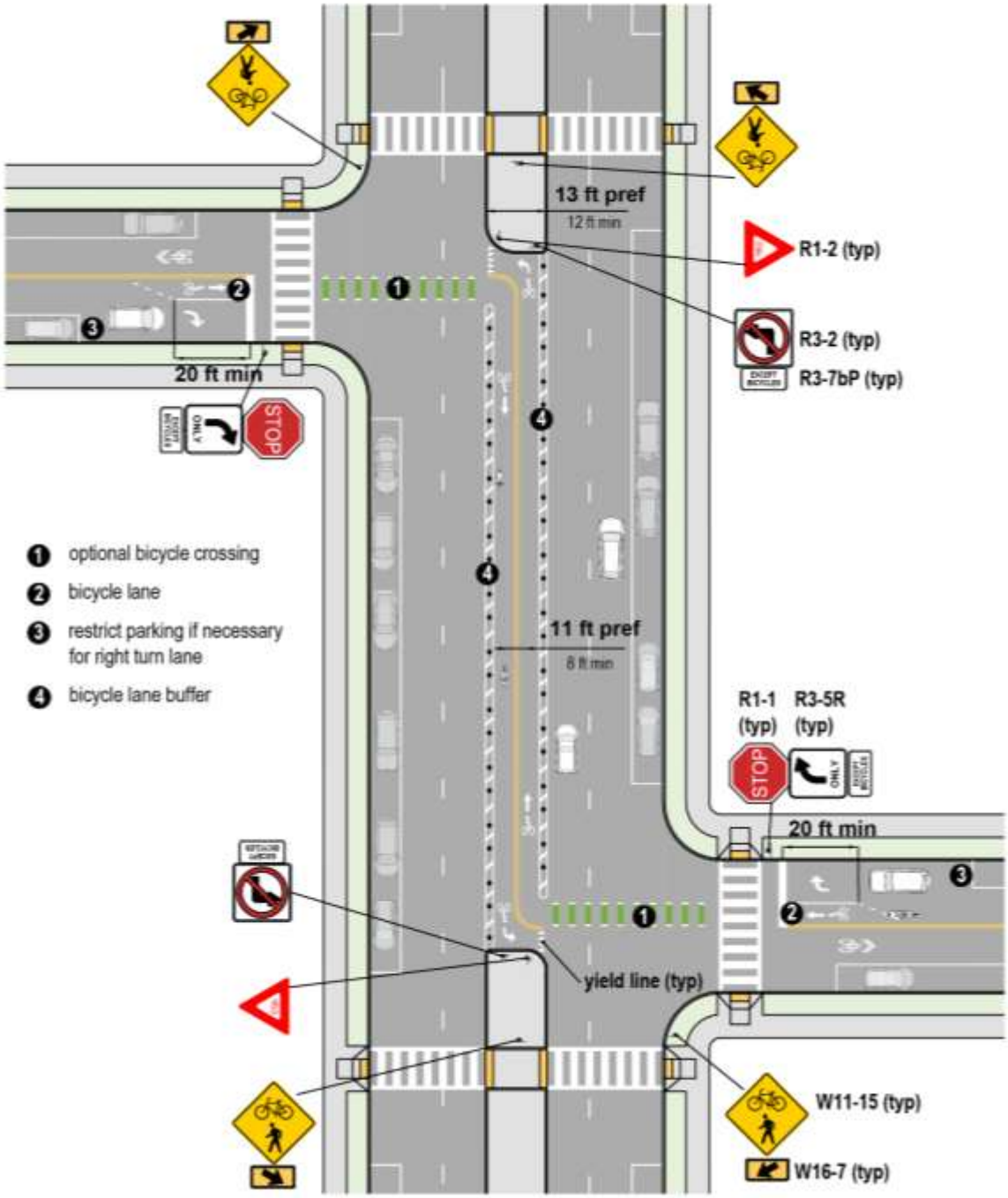
Center Left-Turn Lanes

This option provides a couplet of bicycle-only left-turn lanes in the center of the roadway. This configuration may be used for crossings of two-lane streets where 85th percentile motorized vehicle speeds are less than 35 mph.

- Provide a two-way bicycle lane in the center of the roadway.
  - The preferred width is 11 feet. The practical minimum width is 8 feet.
- As appropriate for the major roadway conditions, provide a buffer and/or vertical separation between the center left-turn bicycle lanes and the adjacent travel lanes (see Section 3.14-3).
- Stripe yield lines on the bicycle lane exits from the center turn lane.

- Where feasible, provide median islands on either end of the left-turn bicycle lane segments.
- Restrict motorized vehicle left turns to and from the minor intersection approaches.
- Provide conflict striping across the major roadway (see Section 3.14-9.2.4).

Figure 50 – Offset Shared Lane Intersection Using Center Left Turn Lane (via AASHTO *Guide for the Development of Bicycle Facilities, 5th Edition*)



Draft, October 12, 2026

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3.14-6.5.3 Skewed and Multi-Leg Intersections

At intersections with more than four approaching legs, or with skew angles other than 90 degrees:

- Provide bicycle conflict markings to communicate expected bicycle paths, including where the approaching bikeway is a shared street or neighborhood greenway. This treatment provides wayfinding for bicyclists and conflict warning for all road users.
- Consider warning devices or signalization to support crossing by bicyclists, based on total intersection conditions, per Section 3.14-6.4.

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3.14-7 Transitions Between Bicycle Facility Types

Transition areas connect the end of one bicycle facility type to the start of a different facility type.

3.14-7.1 Transitions from a Bicycle Lane to a Shared Lane

Where possible, locate transitions from bicycle lanes to shared lanes at or downstream of stop- or signal-controlled intersections to allow bicyclists to merge into the travel lane while vehicles are stopped.

- At signalized intersections, provide an intersection bicycle box (see Section 3.14-6.3.1) to allow bicyclists to enter the vehicle lane while traffic is stopped.
  - Where the bicycle box is adjacent to a sidewalk-level separated bicycle lane, provide a bicycle ramp or break in vertical separation to allow bicyclists to access the box.
- At mid-block locations, provide warning to motorists and bicyclists where bicyclists are expected to enter the roadway.
  - Post a BIKE LANE (MUTCD R3-17) sign with an ENDS (R3-17bP) plaque, a Bicycle Lane Ends (W9-5) sign, or a Bicycles Merging (W9-5a) sign per the MUTCD.
  - Sharrows and/or Bicycles Allowed Use of Full Lane (MUTCD R9-20) signs should be placed downstream of the merge area, per the MUTCD.

3.14-7.2 Bicycle Ramps

A bicycle ramp is a sloped connection that transitions bicyclists between street level and sidewalk-level bicycle facilities, such as sidewalk-level separated bicycle lanes and shared-use pathways, and where there is a grade change, such as approaching a raised crossing (Section 3.14-6.3.5) or a transit island (Section 3.14-8.2).

- Match the width of the connecting bicycle facilities to a preferred minimum of 6 feet. The practical minimum width is 5 feet, which may be used with City Engineer approval.
- Where ramps occur on a lateral shift, maximum taper rates should be per Section 3.14-4.5. The practical maximum angle between a bicycle ramp and the adjoining bicycle facility in constrained conditions is 45 degrees.
- Bicycle ramps should provide a smooth vertical transition with a preferred slope of 1:20 (5%).
  - Steeper ramps may be necessary in constrained conditions. In these cases, the preferred maximum slope is to 1:10 (10%) and the practical maximum is 1:5 (20%). Ramps steeper than 10% cannot have any lateral shift.
- Grade breaks should be perpendicular to the path of travel for people on bicycles.
  - Where grade breaks are not perpendicular to the path of travel, the minimum ramp width is 8 feet.
- Ramps on shared-use pathways intended for shared use by pedestrians must be compliant with accessibility requirements. The running slope must be no more than 1:12 (8.3%) and the cross-slope must be a maximum of 1:48 (2.1%). Grade breaks must be perpendicular to the direction of the curb ramp.
- Ramps directly entering a lane shared with motor vehicles should be avoided. Provide a receiving bicycle lane before requiring bicyclists to merge with general traffic.

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- Provide speed hump markings (per the MUTCD) on bicycle ramps with slopes steeper than 5%, or where the ramp is located between vertical objects (such as approaching a transit island).
- Place tactile directional indicators (TDIs) on the sidewalk along the top of the ramp to guide pedestrians with vision disabilities across the ramp entrance. The TDIs should extend at least 5 feet in both directions beyond the mouth of the ramp.

Do not use detectable warning surfaces (truncated domes) at bicycle ramps because they may incorrectly suggest a pedestrian crossing.

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3.14-8 Midblock Considerations for Bicycle Facilities

This section addresses bicycle facility layout and safety features applied to segments between intersections.

3.14-8.1 Driveways and Alleys

When practicable, bicycle facilities should maintain consistent grade, width, surface, and alignment through driveway and alleyway crossings.

- The bicycle facility cross-slope should not exceed 2 percent through the driveway crossing.

High-use driveways and alleys are defined as driveways and alleys serving more than 50 vehicles during the peak hour; more than 500 vehicles per day; fast-food restaurants, gas stations, convenience markets; or residential, commercial, mixed-use, or lodging land uses with more than 50 on-site parking spaces. At high use driveways and alleys:

- Provide bicycle conflict markings (see Section 3.14-9.2.4) at crossings.
- For **two-way separated bicycle lanes, contraflow bicycle lanes, and shared-use pathways**, provide warning signs alerting crossing motorists to check for two-way bicycle traffic. Place the sign where it would be most visible to drivers and to draw attention to the contraflow bicycle movement.
- For crossings of separated bicycle lanes or shared-use pathways:
  - Provide a setback between the bicycle facility and the roadway edge per Section 3.14-6.3.6. Where a recessed crossing cannot be provided, provide a raised crossing (see Section 3.14-6.3.5) and warning signs (MUTCD W16-21P).
  - Terminate vertical separation elements in advance of the driveway or alleyway per Table 19.

3.14-8.2 Transit Stops

This section addresses bicycle facilities and their interactions with transit stops including in-lane transit stops and floating transit islands.

- Where feasible, route bicycle lanes and shared use paths behind transit platforms, creating a "floating transit island."
  - Avoid mixing zones, where buses share space with striped and buffered bicycle lanes; instead, consider establishing short sections of separated bicycle lanes along bus stops.
- When pedestrians must cross bicycle paths to access the transit stop:
  - Place yield markings and signs requiring bicycles to yield to pedestrians (MUTCD R9-6) in the bicycle lane or pathway in advance of the transit stop.
  - The cross slope of the bicycle lane or shared use path must comply with PROWAG guidelines.
  - The crossing(s) should be a minimum of 6 feet wide.
  - Provide detectable warning indicators (truncated domes) on either end of the crossing(s).
  - Provide an audible indication (for example, a bell sound) alerting pedestrians with vision disabilities to approaching bicyclists.
  - Utilize transit stop amenities, railings (per Section 3.14-4.9), planters, tactile warning delineators (TWD), and/or other detectable edge treatments to direct pedestrians—particularly those with vision disabilities—to crossing locations.

  - At near-side stops adjacent to signalized intersections and for all far-side stops, set the crossing(s) at least 6 feet (10 feet, where practical) back from the adjacent intersection to allow for bicycle queuing between the transit stop and the intersection.
- Where a street-level bicycle lane (separated, buffered, or striped) is transitioned to a sidewalk-level separated bicycle lane, provide ramps per Section 3.14-7.2. Locate ramps outside of any lateral shift of the bicycle lane.
- Provide visual contrast between the bicycle lane and adjacent pedestrian areas using different pavement materials or green colored pavement on the bicycle facility.
- For two-way separated bicycle lanes and multi-use paths, provide a solid yellow line along the transit stop and any associated ramps or tapers.
- In constrained conditions, the width of the bicycle facility may be reduced as far as the practical minimum width.
- For a Mixing Zone, Street-Level Bicycle Lanes in Front of Transit Stop, provide bicycle conflict markings through the mixing zone per Section 3.14-9.2.4.
  - Where a bicycle lane is located between a bus-only or Business Access and Transit (BAT) lane and the curb, the mixing zone may be indicated with dashed, red-colored pavement.
  - For separated and buffered bicycle lanes, taper the street buffer approaching and departing the transit stop per Table 19.
  - For separated and buffered bicycle lanes where the combined width of the bicycle lane and street buffer is greater than 12 feet (including parking-protected separated bicycle lanes), provide a buffer between the conflict markings and the adjacent travel lane to provide a continuous visual buffer to the bikeway and allowing any passing bicycle traffic to use the buffer area to maneuver around stopped buses.
- Bus-only or Business Access and Transit (BAT) lanes may be designated as bicycle facilities operating as shared lanes.
  - Shared bus-bicycle lanes should be at least 12 feet wide.
  - If 13–14 feet of space is available adjacent to stops, stripe a marked buffer on the left side of the bus-bike lane so that buses are guided to the right, allowing any passing bicycle traffic to use the buffer area to maneuver around stopped buses.
  - Where more than 15 feet of space is available, consider marking a constrained bicycle lane to the left of the bus lane, marked with bike symbols. Do not apply red surface treatment in the bicycle lane.
  - Install signs and markings permitting buses and bicycles while excluding other traffic:
    - Apply red high-friction surface treatment to the full width of the lane.
    - Use a solid white lane line to demarcate the lane.
    - Use BIKE BUS ONLY or similar pavement markings.
    - Overhead signs are preferred.

3.14-9 Signing and Striping for Bicycle Facilities

3.14-9.1 Traffic Control Signs for Bicycles

Refer to Section 3.12-1 for general provisions regarding traffic control signs.

3.14-9.1.1 Stop and Yield Signs

Generally, intersection approaches carrying bikeways should be uncontrolled to allow for continuous free-flowing operations for bicyclists.

Where a **neighborhood greenway crosses a local street**, apply stop control to the non-bikeway approach:

- Where **two bikeways on local streets cross**, apply stop control to the street that carries the lowest volume of pedestrians and bicyclists.
- Stop control should be applied to the bikeway(s) where adequate intersection sight distance is not provided or where obscured sight lines, dips, or crests require lower approach speeds.

Where a **bikeway crosses a collector or arterial street**, apply stop control to the approaches that carry the lowest volume of roadways users.

For shared-use pathway crossings:

- Yield signs should be shown to the shared-use pathway approach where bicyclists have an adequate view of conflicting traffic as they approach the sign (see Section 3.14-6.1), and where bicyclists are required to yield the right-of-way to conflicting traffic.
- For crossings of **local streets**, stop control should be applied to the local street, with yield signs shown to the shared-use pathway.
- At **crossings of collector or arterial streets**, stop control should be applied to the shared-use pathway.
- Where conditions require shared-use pathway users or bicyclists on separated bikeways, but not vehicles on the roadway, to stop or yield, the STOP or YIELD sign should be placed or shielded so that it is not readily visible to roadway users.

3.14-9.1.2 Bicycle Lane Signs

Post signs reinforcing bicycle lanes and parking regulations per Standard Plan G-61 and the MUTCD.

3.14-9.1.3 Bikeway Street Signs

Bikeway street signs substitute for other street signs for roadways designated as Tier 1 bicycle routes in the Bicycle Master Plan.

Bikeway street signs are modified MUTCD D3-1 that include a bicycle symbol. The bicycle symbol shall be the height of the principal legend height and placed to the left of the street name in accordance with the inter-word spacing given in the FHWA *Standard Highway Signs* publication.

3.14-9.1.4 Neighborhood Greenway Sign

Neighborhood greenway signs are as shown in Standard Plan G-XX. They may be independently mounted or mounted below speed limit signs.

Place neighborhood greenway signs:

- Approximately 50 feet after intersections with collector or arterial roadways.

- Approximately 50 feet after intersections at which the designed neighborhood greenway roadway is offset and undergoes a name change, unless the route segment is less than 600 feet in length.
- Otherwise, at ¼ mile intervals.

3.14-9.1.5 Shared Street Sign

Post Shared Street Yield to Bicycles and Pedestrians sign assemblies (Standard Plan G-XX) on roadway entrances to shared street facilities.

3.14-9.1.6 Wayfinding

Bicycle wayfinding signs and markings provide directional guidance to bicycle facility users. They should guide users along the network of Tier 1 bicycle routes in the Bicycle Master Plan.

Wayfinding signs may be used to:

- Guide users along the bicycle network.
- Provide navigational guidance to major destinations, such as shared-use paths, neighborhood centers, or parks.
- Provide direction in a gap between existing sections of a bicycle facility.
- Provide location-specific guidance for bicyclists, such as:
  - How to travel along a bicycle facility that may not be intuitive (for example, a contraflow facility or a transition between bicycle facility types)
  - How to access a parallel route.
  - How to access and cross a bridge or underpass.
  - How to navigate an area with a complex street layout.
  - How to navigate bikeway route that does not follow a direct path.

The design of bicycle guide and service signs should be per the MUTCD.

Wayfinding signs should be placed in the following locations:

- Along Tier 1 bicycle routes, a Bike Route Guide (MUTCD D11-1c) or Bicycle Destination and Distance (D1, D2, or D11-10 series) sign should be placed at least every ¼ mile.
- Bicycle Destination and Distance signs should be placed upstream of intersections between Tier 1 bicycle routes.
  - Bike Route Guide signs may also be placed downstream of these intersections to provide bicyclists with confirmation of the correct direction of travel.
- Street name signs (MUTCD D3-1) should be provided where access is provided to the street network along shared-use paths that do not travel along roadways.
- At other locations, as deemed appropriate through engineering judgement.

Distances displayed on bicycle wayfinding signs should be rounded as provided in Table 28.

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Table 28 – Bicycle Wayfinding Signs Mileage Rounding

Distance (miles)	Guideline
< 0.2	Do not include mileage
0.2 – 5.0	Round mileage to the nearest tenth of a mile
> 5.0	Round mileage to the nearest whole mile

3.14-9.2 Markings

Refer to Section 3.12-2 for general provisions regarding parking markings. Refer to the MUTCD for provisions specific to marking bicycle facilities.

3.14-9.2.1 Longitudinal Lines

Application

Longitudinal lines shall be used to designate all bicycle lane types (separated, buffered, or striped), and for centerlines on directionally separated shared-use pathways and two-way bicycle lanes.

Design Criteria

- Separated and buffered bicycle lanes:
  - Street buffer: Two 6-inch wide solid white lines (6-inch line hatching, where used)
  - Parking buffer: Two 4-inch wide solid white lines (4-inch line hatching, where used)
- Striped bicycle lane: 6-inch wide solid white line.
- Contraflow bicycle lanes: Two 6-inch wide solid yellow lines.
  - Include lane extension markings where contraflow bicycle facilities cross intersections.
- Two-way bicycle lane and shared-use pathway centerline:
  - Where passing is permitted: 4-inch wide broken (3-foot solid with 9-foot gap) yellow line.
  - Where passing is discouraged: 4-inch wide solid yellow line.
- Bicycle lane line extensions through intersections: 6-inch dotted (2-foot solid with 6-foot gap) white line.

3.14-9.2.2 Bicycle Symbol Markings in Bicycle Lanes

Bicycle lane symbol markings consist of a bicycle symbol and an arrow.

Place bicycle lane symbol markings within a bicycle lane between 30 and 50 feet downstream from an intersection or high-use driveway and spaced at approximately 500 feet thereafter. Place the first marking after an intersection or driveway outside of the wheel path of turning vehicles.

3.14-9.2.3 Green-Colored Pavement

Green-colored pavement may be used to increase the conspicuity of a bicycle facility at conflict points such as intersections, driveways, loading zones, and transit islands; in intersection bicycle boxes and two-stage bicycle turn boxes; in other locations where incursion in the bicycle lane by other users is expected; and in other locations where enhanced conspicuity may be expected to

increase bicycle facility user safety. Green-colored pavement shall be applied in accordance with the MUTCD.

Where bicycle lanes 7 feet or wider are provided, install green-colored pavement markings in the bicycle lane for the first 20 feet of each street block to avoid confusion of the bicycle lane with a parking or motor vehicle lane. This use of green-colored pavement in the bicycle lane may be omitted where bicycle conflict markings (Section 3.14-9.2.4) are applied through an intersection.

3.14-9.2.4 Bicycle Conflict Markings



Bicycle conflict markings consist of green cross bars with dotted white edge lines. Bicycle conflict markings should be applied under the following conditions, except where street art is present:

- Separated, buffered, or striped bicycle lanes crossing intersections, including:
  - Signalized intersections where permissive turns are permitted across the bicycle lane
  - Alleys and driveways where high volumes of conflicting motor vehicle movements are present or expected (see Section 3.14-8.1).
  - Intersections within high bicycle volume areas (per Section 3.14-2).
- Neighborhood greenway crossings of roadways with an ADT greater than 3,000.
- Where the provision of markings can enhance bicycle wayfinding at complex or non-intuitive intersection crossings, as determined through engineering judgement.
- Where a bicycle lane weaves or mixes with vehicle movements, including:
  - In intersection approaches with mixing zones.
  - At transit pullout stops.

Bicycle conflict markings **shall not** be used for shared-use path crossings, which should be marked with standard crosswalk markings.

Where bicycle lanes approach intersections, terminate the bicycle lane marking(s) where motorists must cross the bicycle lane and provide bicycle conflict markings through the conflict area.

- For separated and buffered bicycle lanes, the width of the conflict markings should be the same as the full bicycle lane and buffer, to maintain a continuous edge for the adjacent vehicle lane.

Bicycle conflict markings should consist of 2-foot bars separated by 6-foot gaps. The size of the gaps may be adjusted to avoid crossing vehicle wheel paths.

- For bicycle lanes adjacent to longitudinal bar crosswalks, the green bars of the bicycle conflict markings should align with the white ladder bars of the adjacent crosswalk.
- A gap of at least 1 foot should be provided between a crosswalk and the bicycle conflict markings.
- The dotted lines on the sides of the green markings should match the color and width of the bicycle lane lines they are extending.
  - If the dashed line is extending a curb, 4-inch white markings should be used.
- When used with two-way bicycle lanes, a single yellow centerline should be included within the conflict markings.

- Where used with a bicycle lane, the width of the bicycle conflict marking should match width of connecting bicycle lane.
- Where used to enhance a neighborhood greenway crossing:
  - 8-inch-wide white markings should used.
  - The markings should be at least 5 feet wide.
  - The markings should align with the intended paths of travel by bicyclists.
  - Consideration should be given to removing any existing on-street parking (up to 20 feet) upstream and downstream the marking, where the marking would potentially direct a user into a parked vehicle.

3.14-9.2.5 Sharrows



Sharrow markings are used on bikeways designated as shared-lane bicycle facilities and on neighborhood greenways. Sharrows may be used, but are not required, on non-bikeway shared lane facilities. They should not be placed on roadways that have speed limits of 40 mph or greater.

On **shared-lane bicycle facilities**, place sharrows no more than 50 feet downstream from an intersection and spaced at no greater than 250 feet thereafter (per MUTCD Section 9E.09), measured center-to-center.

- Sharrows should be placed within the lane per Table 29.
- When used on multilane roadways, sharrows should be placed in the outside lane.

Table 29 – Sharrow Placement for Shared Lanes

Travel Lane Context*	Sharrow Placement
Travel lane is <14 feet wide, not adjacent to parking	Center in lane
Travel lane is ≥14 feet and <16 feet wide, not adjacent to parking	4 feet away from edge of roadway**
Travel lane is <16 feet wide, adjacent to parking	Center in lane, at least 12 feet away from edge of roadway**
Travel lane is 16 feet or wider	*A striped bicycle lane should be provided instead of a shared lane*
* On roadways with center line present, travel lane is measured from the edge of pavement/parking lane to the center line. On two-way roadways without centerline, the travel lane is measured from the edge of pavement/parking to the middle of the road. On one-way roadways without centerline, the travel lane is measured from the edge of pavement/parking to the edge of pavement/parking. ** Edge of roadway is defined as edge of pavement, edge of gutter, or face of curb with no gutter.	

Along **neighborhood greenways**, provide sharrows at approximately 125-foot spacing, measured center-to-center.

- Determine sharrow spacing by corridor segments bounded by collector or arterial roadways, intersecting greenways, or route direction changes.
- Place the first sharrow 25 feet beyond the bounding street.
- Alternate sharrow orientation at 125-foot spacing through the segment.
- Add a leading sharrow where needed and adjust placement for supplemental sharrows.

Use supplemental sharrows at route changes and intersections with other Neighborhood Greenways. Place supplemental sharrows approximately 50 feet in advance of the curb or pavement edge of the bounding street.

Sharrows along neighborhood greenways should be laterally offset from the curb based on Table 30. Plans should specify both lateral and longitudinal placement for sharrows.

- Offsets are measured from face of curb to centerline of sharrow.
- If no curb exists, position sharrows (measured from edge of pavement) based on whether parking occurs on paved roadway or outside of paved roadway.

Table 30 – Sharrow Placement for Neighborhood Greenways

Street Width (feet)	Curb Offset (feet)		
	On-Street Parking		No On-Street Parking
	Both sides	One Side*	
18		12 / 4	5.5
20		13 / 5	6
22		14 / 6	6.5
24	11.5	15 / 7	
26	12.5	13.5 / 5.5	
28	13.5	14 / 6	
30	14.5		
32	13		
34	13.5		
36	14		

* The larger number in the "One Side" column corresponds to the offset from the curb on the side of the street where parking is permitted; the smaller number corresponds to the offset from the curb on the side of the street where no parking is permitted.

On all facilities, adjust sharrow spacing as needed to avoid placing them within 25 feet of intersections, crosswalks, or speed bumps, or on utilities.

3.14-9.3 Temporary Traffic Control for Bicycle Facilities

Temporary traffic control for work affecting bicycle facilities and shared-use pathways shall be per the MUTCD.

Where bicyclists are routed over steel plates, those plates should be slip resistant with a smooth lip along the edges which bicycle wheels may pass over.

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3.14-10 Bicycle Parking

3.14-10.1 Bicycle Racks

Bicycle racks are used to securely lock parked bicycles. Racks must allow the bicycle frame and both wheels to be locked to the rack with a U-lock. They shall support a bicycle in a stable position with a minimum of two points of contact to the bicycle frame; without damage to the wheels, frame, or components; and without requiring the bicycle to be lifted.

- Inverted-U racks are the City's standard. They should be 33 inches tall and 24 inches wide, having a pipe radius of 2.37 inches and pipe thickness of 0.15 inches. The City's Bicycle Parking Guidelines provide examples of other rack types that meet the above requirements.
- Racks should be made from galvanized steel or stainless steel with a powder coating finish to make them theft-resistant and to allow the surface to weather in an aesthetically pleasing manner.

Place bicycle racks:

- Entirely within the furnishing zone.
- At the same grade as the sidewalk or at a location that can be reached by an accessible route.
- On a paved surface.

Do not place bicycle racks adjacent to ADA parking spaces or directly in front of windows and doors that would act as a fire escape.

Provide clearances between bicycle racks and nearby objects per Table 31.

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Table 31 – Minimum Sidewalk Clearances for Bicycle Racks

Location	Recommended Clearance (feet)	Practical Minimum (feet)
Sidewalk Widths for Bicycle Rack Installation (Rack Parallel to Curb)		
Between curb face and property line, building, or café seating (commercial)	10	9
Between curb face and building (residential)	10	7
Between bicycle rack and property line, building, or café seating (commercial)	7	6
Between bicycle rack and building (residential)	7	4
Sidewalk Widths for Bicycle Rack Installation (Rack Perpendicular to Curb)		
Between curb face and property line, building, or café seating (commercial)	16	15
Between curb face and building (residential)	15	
Between bicycle rack and property line, building, or café seating (commercial)	11	10
Between bicycle rack and building (residential)	10	
Bicycle Rack Clearances from Other Sidewalk Objects		
In-ground utility pull box	Allow room to remove cover	
Tree or tree well; news rack; trash can; street light pole; curb cut; driveway	5	2
Bicycle rack, end-to-end (along curb)	6	4
Bicycle rack, side-to-side (parallel to other racks)	3	
Fire hydrant; standpipe near street	15	
Building entrance; standpipe near entrance	11	
Parking meter pole (when placing one rack between two meter poles that are <18 feet apart)	5	
Parking meter pole (when placing one rack between two meter poles that are >18 feet apart)	4	
Angled car parking (consider placement of meters and car overhang)	4	2
Traffic sign pole (midblock)	5	
Traffic sign pole (intersection)	5	2
Bicycle Rack Clearances from Parking		
Parallel car parking	3	2
Angled car parking (60-45 degrees)	3	3
Perpendicular car parking	5	

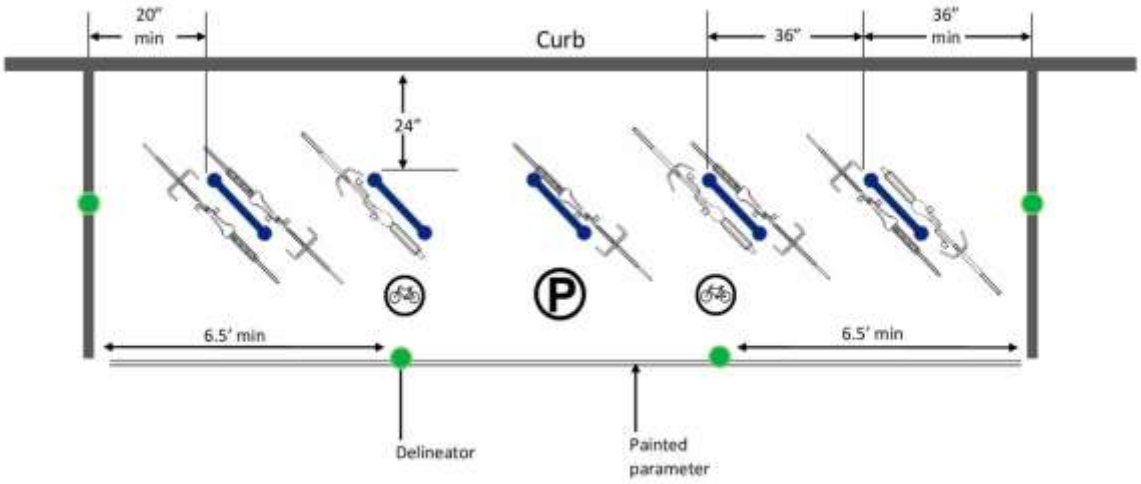
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3.14-10.2 Bicycle Corrals

Bicycle corrals are high-volume bicycle parking areas placed in the street, in a parking stall, or in other available areas within the Flexible Area, usually consisting of 3 or more inverted-U bicycle racks. Design bicycle corrals in accordance with Figure 51.

- Angle racks where required for narrower parking lanes.
- Delineators, a striped perimeter, and bicycle parking stencil markings are required.
  - Set delineators back from travel lanes at least 1 foot.
  - Rubber curbs along the latitudinal edges of the corral are recommended.
  - Planters and reflective bollards may also be used.

Figure 51 – Bicycle Corrals



DRAFT

BRIEFING PAPER: Transportation Commission Rep Selection

City of Spokane
Bicycle Advisory Board
10/20/2026

Subject:
Transfer of Chair responsibilities and Transportation Commission Liaison.

Background:
Lauren has taken a new role with the Plan Commission and will need to step away from the BAB and Transportation Commission. This is the formal transfer of Chair duties and selection of the Transportation Commission Liaison position.

Per the Transportation Commission municipal code Section 04.40.030 Membership the Transportation Commission membership shall consist of: “One at-large member representing the bicycling community as a member of the Bicycle Advisory Board who shall be selected by that board and shall be familiar with the development and implementation of the Bicycle Master Plan; and”

Relationship to Plans/Actions:
N/A

Timeline/ Further Action:
The Bicycle Advisory Board will select a person to represent them at the Transportation Commission.

AGENDA